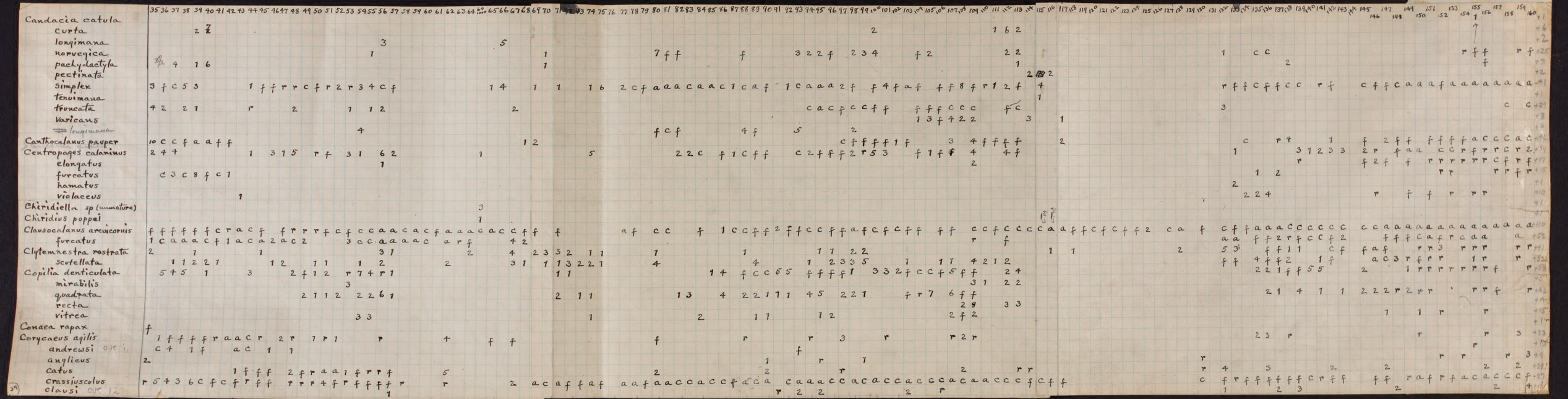

Candacia catula
curta
longimana
norvegica
pachydactyla
pectinata
simplex
tenuimana
truncata
variicans
longimana
Canthocalanus pauper
Centropages calaninus
elongatus
furcatus
hamatus
violaceus
Chiridiella sp (immature)
Chiridius poppei
Clausocalanus arcuicornis
furcatus
Clytemnestra rostrata
scutellata
Copilia denticulata
mirabilis
quadrata
recta
vitrea
Conaea rapax
Corycaeus agilis
andrewsi
anglicus
catus
crassiusculus
clausi

Calanus minor		f	f		tenuicornis			f
Candacia simplex		1			Oithona attenuata			2
Clausocalanus arcuicornis	a	a	c		fallax			a
Corycaeus agilis	f				setiger			f
dubius	r				similis	f	c	a
flaccus	r				spinirostris			c
pacificus			3		Oncaea minuta		a	a
pumilus			2		venusta	1	a	a
typicus		f			Paracalanus parvus	4	c	f
Farranula carinata			c		Pleuromamma abdominalis			1
gibbula	f				gracilis			1
rostrata		f	c		Pseudocalanus minutus	f	c	c
Heterorhabdus papilliger			4		Sapphirina sulpal			5
Lucicutia clausi			1		Scolecithrix danae		f	f
flavicornis		1	f		Temora		2	
Mecynocera clausi		c	a		Undinula darwini			c
Metridia lucens		4			Paracalanus pygmaeus		f	

STATION 34

Lat. 11° 18' N. Lon. 78° 34' W. Oct. 9, 1928.

Bottom depth 3536 m.

Depth, meters	0	50	100	Depth, meters	0	50	100
Temperature, C.	28.5	24.0	20.5	Density, σ_t	22.9	24.7	26.3
Salinity, o/oo	35.8	36.0	36.6	Phosphates mg/m³	2.	3.	16.

	0	50	100		0	50	100
Acartia clausi		r	f	Lubbockia squillimana			r
Aetideus armatus			r	Lucicutia flavicornis		c	
Calanus helgolandicus			r	Macrosetella gracilis	r	c	f
minor		c	f	occulata		r	r
Calocalanus pavo		f	r	Mecynocera clausi		f	r
Candacia bispinosa		r	r	Megacalanus longicornis		r	f
norvegica		r		Microsetella norvegica	c	f	f
Clausocalanus arcuicornis		f	c	rosea		r	f
Clytemnestra scutellata		r		Oithona plumifera	c	c	f
Copilia denticulata		r		similis		c	f
Corycaeus agilis	f	r		spinirostris		r	f
crassiusculus	f	c	c	Oncaea minuta	r	r	r
speciosus	c	r	f	tenella	r		
Eucalanus elongatus		f	f	venusta	a	c	a
Euchaeta marina		a	a	Paracalanus parvus		r	f
Farranula carinata	c	r	f	Pleuma spinifera		c	c
gibbula	f			Portella obscurifer	r		
rostrata	c	f	f	Portellina plumata		r	
Haloptilus ornatus		r	f	Pseudocalanus minutus	f	f	
Oithonina nana		r		Rhincalanus cornutus		c	f
				nasutus		c	c
				Sapphirina angusta			r
				scarlata		r	
				Scolecithrix danae		c	a
				Spinocalanus abyssalis			r
				Temora longicornis	r	r	r
				stylifera	c	r	r
				Undinula vulgaris		c	c

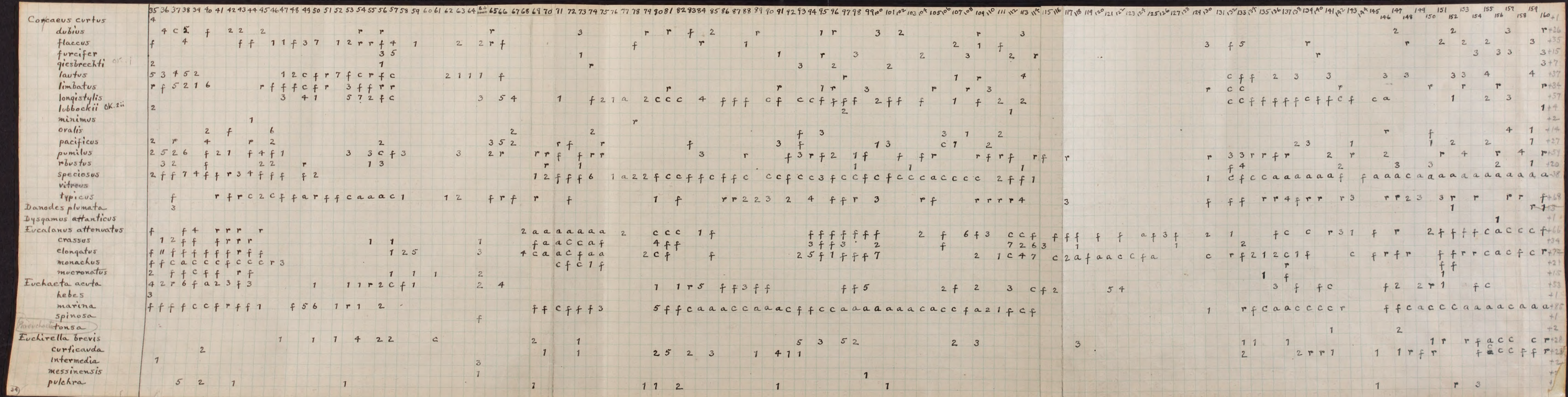
STATION 33

Lat. 13° 37' N. Lon. 76° 22' W. Oct. 8, 1928.

Bottom depth 4039 m

Depth, meters	0	50	100	Depth, meters	0	50	100
Temperature, C	28.4°	28.1	22.3	Density, σ_t	22.7	23.4	25.7
Salinity, o/oo	35.6°	36.2	36.4	Phosphates mg/m³	4.	4.	23.

Calanus helgolandicus	r		Microsetella norvegica	f	c
minor		r	rosea		r
propinquus		r	Oithona plumifera	r	r
Candacia bispinosa	r		similis	r	
Corycaeus crassiusculus	f		Oncaea minuta	f	
speciosus		f	venusta	c	c
Eucalanus elongatus	r		Paracalanus parvus	r	
Euchaeta marina	f	r	Pseudocalanus minutus	f	
Farranula carinata	r	f	Rhincalanus nasutus		r
gibbula	f		Temora longicornis	ra	c
rostrata		f	stylifera	f	r
Lubbockia squillimana		r	Undinula vulgaris		r
Lucicutia flavicornis	ra.				
Macrosetella gracilis	r	c			
Mecynocera clausi	r				


Corycaeus curtus
dubius
flaccus
furcifer
giesbrechti
lautus
limbatus
longistylis
lubbockii
minimus
ovalis
pacificus
pumilus
robustus
speciosus
vitreus
typicus
Canodes plumata
Dysgamus atlanticus
Eucalanus attenuatus
crassus
elongatus
monachus
mucronatus
Euchaeta acuta
hebes
marina
spinosa
tonsa
Paraeuchaeta
Euchirella brevis
curticauda
intermedia
messinensis
pulchra

Calanus helgolandicus			c		Mecynocera clausi				r		
minor	f	a	f		Microcalanus pusillus				f		
propinquus			r		Microsetella norvegica			f	f	c	
Calocalanus pavo			r		Oithona plumifera			r			
Candacia bispinosa		r	r		similis				f	c	
norvegica	r				spinirostris					f	
pachydactyla		r	r		Oithonina nana				f		
Centropages furcatus	f		r		Oncaea conifera			2			
ramatus	f				media			r	c		
Clausocalanus arcuicornis	r				minuta			c	f	f	
Clytemnestra scutellata		r			subtilis				r		
Copilia denticulata	r				venusta			c	a	v.a.	
Corycaeus anglicus	f				Paracalanus parvus			c	a	a	
crassiusculus			f		Pharma spinifera					f	
dubius	r				Pontella lobiancoi			r			
furcifer		r			sp.			r			
lautus		2			Pontellina plumata			r			
minimus			r		Pseudocalanus minutus			f	a	c	
speciosus	f	a	a		Rhincalanus nasutus			c		c	
Eucalanus elongatus		c	f		Scolecithrix danae				r	c	
Euchaeta marina	c	a	c		Temora longicornis			r	f	r	
Farranula carinata	c	f	f		stylifera			f	f	a	
rostrata	c	f	f		Undinula vulgaris					r	

STATION 31

Lat. 14° 46' N. Lon. 63° 26' W. Oct. 3. 1928

Bottom depth 1635 m.

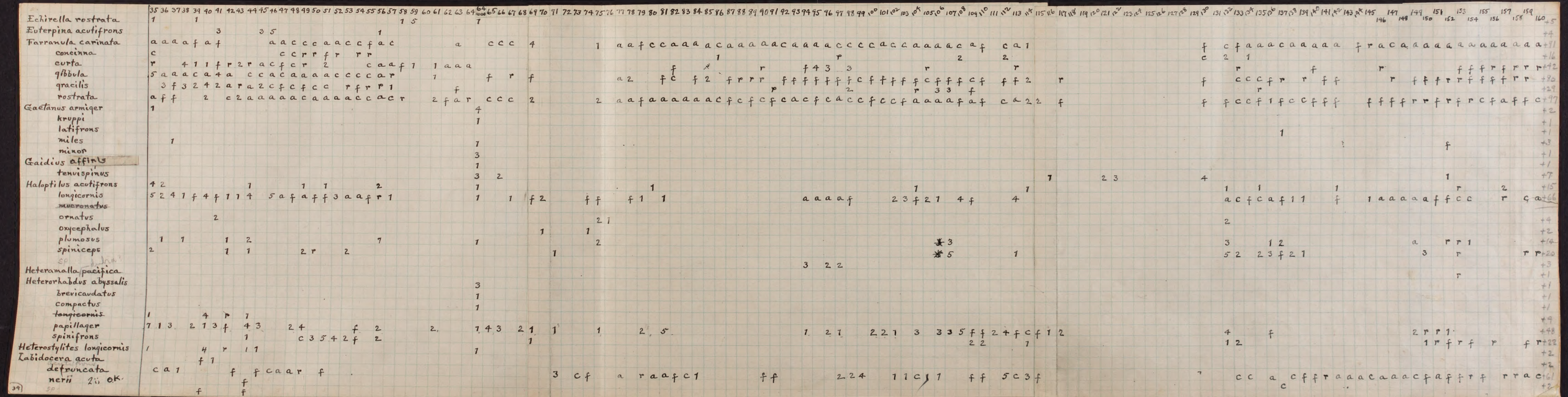
Depth, meters	0	50	100	Depth, meters	0	50	100
Temperature, C.	28.5	28.2	23.4	Density, σt P.	21.7	22.8	25.4
Salinity, o/oo	34.4	35.0	36.1	Phosphates mg/m³	2.	2.	28.
	0	50	100		0	50	100
Acartia longiremis		f		Labidocera wollastoni		r	r
Aetideus armatus			r	Lubbockia squillimana		r	c
Calanopia americana		r		Rocicutia flaviconis			c
Calanus helgolandicus	a		f	grandis			r
minor		c	c	Macrosetella gracilis		c	a
Calocalanus pavo		r	r	Mecynocera clausi			r
Candacia bispinosa		r		Microcalanus pusillus		r	f
norvegica			f	Microsetella norvegica		c	c
pachydactyla		r		rosea			c
simplex		r	f	Oithona nana		r	r
Clausocalanus arcuicornis		f	f	plumifera		f	f
Clytemnestra scutellata		r	r	similis			a
Corycaeus anglicus	r			spinirostris		r	c
clausi		r		Oithonina nana		f	f
crassiusculus			v.a.	Oncaea minuta		c	c
flaccus	r			venusta	f	a	v.a.
minimus			r	Paracalanus parvus	a	f	a
speciosus	f	c		Pharma spinifera			f
typicus		f		Pontellina plumata			r
Euchaeta marina		c	f	Pseudocalanus minutus	a	f	c
Farranula carinata		c	c	Rhincalanus cornutus	f	f	f
curta	r			nasutus		f	f
gibbula			f	Sapphirina auronitens		r	
rostrata			c	Scolecithrix danae		f	
Haloptilus ornatus			f	Temora stylifera		f	r
Copilia denticulata		r					

STATION 30

Lat. 12° 54' N. Lon. 56° 15' W. Sept. 15. 1928

Bottom depth 4703 m.

Depth, meters	0	50	100	Depth, meters	0	50	100
Temperature, C	28.0	27.7	24.1	Density, σt P.	23.3	23.5	25.1
Salinity, o/oo	36.0	36.0	36.3	Phosphates mg/m³	2.	3.	3.
Relative abundance		0	50	100		0	50	100
Calanus helgolandicus		c	f	c	Macrosetella gracilis	c	f	c
minor		f		c	ocellata	r		
propinquus				f	Mecynocera clausi		f	r
Calocalanus pavo		a	c	f	Microcalanus pusillus			r
stylifemis		f	r		Microsetella norvegica	c	f	c
Candacia bispinosa		f			rosea	r		c
pachydactyla		r			Oithona helgas			r
simplex				f	plumifera		f	
Centropages furcatus			r		similis		c	
Clytemnestra scutellata			r		spinirostris			c
Corycaeus agilis			r		Oncaea curta			r
crassiusculus		a			media		f	
dubius		r			minuta	f	f	
f. imbatus		r			notopa	r	r	
lautus			r		subtilis	f		
pumilus				r	tenella			r
speciosus		a	f		venusta	a	c	r
Euchaeta marina				f	Paracalanus parvus	f	c	c
Farranula carinata		c	f	f	Pharma spinifera		f	
gibbula				f	Pontellopsis perspicax	r		
rostrata		r		r	Pseudocalanus minutus		c	
Haloptilus ornatus				c	Rhincalanus cornutus			f
Lucicutia clausi				r	Scolecithrix danae			f
flavicornis				r	Undinula vulgaris	r		r


Echirella rostrata
Euterpina acutifrons
Farranula carinata
concinna
curta
gibbula
gracilis
rostrata
Gaetanus armiger
kruppi
latifrons
miles
minor
Gaidius affinis
tenuispinus
Haloptilus acutifrons
longicornis
mucronatus
ornatus
oxycephalus
plumosus
spiniceps
Heteramalla pacifica
Heterorhabdus abyssalis
brevicaudatus
compactus
longicornis
papillager
spinifrons
Heterostylites longicornis
Labidocera acuta
detruncata
nerii

Candacia bispinosa			f		Microsetella norvegica			f	c	a
pachydactyla			f		Miracia efferata			f		
simplex			f	r	Oithona plumifera				f	a
Clytemnestra scutellata			f		similis				f	a
Corycaeus crassiusculus				f	spinirostris				f	a
speciosus		f	a	c	Oithona nana				c	a
Eucalanus elongatus			r		Onchaea mundta				f	a
Euchaeta marina			r	f	venusta			c	a	a
Euchirella brevis			r		Paracalanus parvus					f
pulchra				r	Phaenna spinifera				f	f
Farranula carinata		f	a		Pontellina plumata			r	r	r
gibbula		f			Pontellopsis perspicax			r		
rostrata			f	f	Pseudocalanus minutus				c	c
Haloptilus longicornis				c	Sapphirina nigromaculata				r	
Lucicutia clausi				f	Scolecithrix danae				f	r
					Undinula vulgaris				r	r

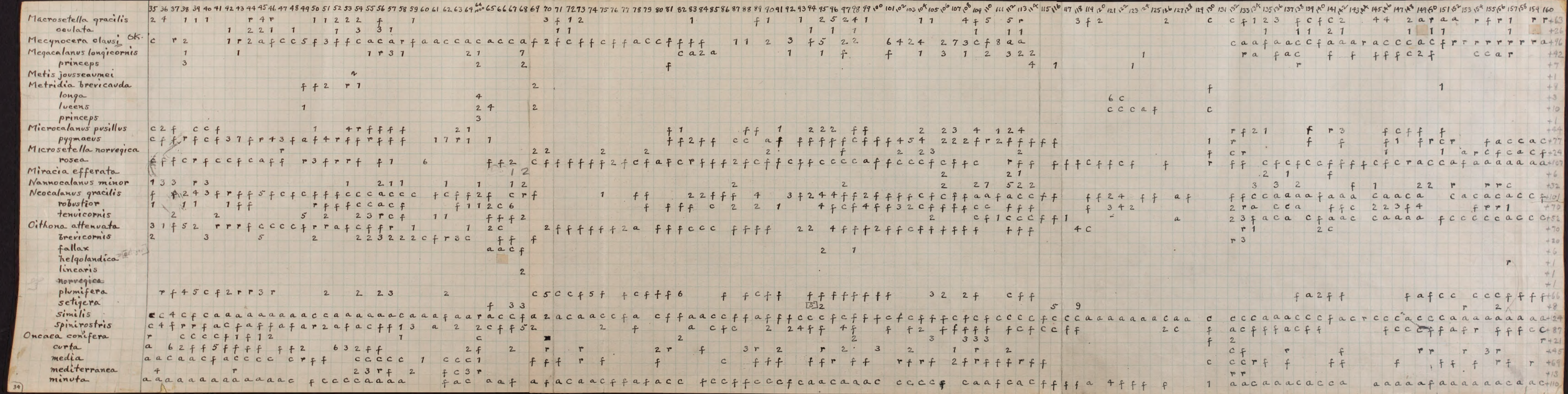
STATION 28

Lat. 13° 10' N. Lon. 149° 36' W. Sept. 11, 1928

Bottom depth 4925 m

Depth, meters	0	50	100	Depth, meters	0	50	100
Temperature, C	27.6	26.7	22.8	Density σt	23.4	24.10	25.06
Salinity, o/oo	36.2	36.3	36.6	Phosphates mg/m³	4.	4.	7.

Relative abundance	0	50	100		0	50	100
Acartia clausi			r	Lubbockia squillimana			r
longiremis	r			Lucicutia clausi		c	c
Actideus armatus		r		flavicornis		c	c
Calanus helgolandicus	c	f	f	Macrosetella gracilis	a	c	c
minor	c	f		Mecynocera clausi		r	r
propinquus	f			Megacalanus longicornis		r	r
Calocalanus pavo	c	r		Microcalanus pusillus	r	r	
Candacia aethiopica	r			Microsetella norvegica	a	c	c
bispinosa	r	r		rosea		r	r
pachydactyla		r		Oithona plumifera		r	
Centropages hamatus	r			similis		f	c
furcatus	r		r	spinirostris			r
Clausocalanus arcuicornis			r	Onchaea mundta		c	c
Corycaeus crassiusculus	f		r	venusta	c	a	c
speciosus	c	f	c	Paracalanus parvus	f	f	c
typicus	f			Pontellopsis perspicax	r		
Euchirella brevis			r	Pseudocalanus minutus	f	c	f
Farranula carinata	c	f	c	Rhincalanus cornutus			r
gibbula	r			Sapphirina nigromaculata	r		
rostrata	c	f	f	Scolecithrix danae			f
Haloptilus ornatus		c	f	Teinora stylifera	f	r	f
Labidocera nerii	f						


Macrosetella gracilis
oculata
Mecynocera clausi OK
Megacalanus longicornis
princeps
Metis jousseaumei
Metridia brevicavda
longa
lucens
princeps
Microcalanus pusillus
pygmaeus
Microsetella norvegica
rosea
Miracia efferata
Nannocalanus minor
Neocalanus gracilis
robustior
tenuicornis
Oithona attenuata
brevicornis
fallax
helgolandica
linearis
norvegica
plumifera
setigera
similis
spinirostris
Oncaea conifera
curta
media
mediterranea
minuta
34

bispinosa	a	r		Miracia efferata	f			r
simplex	f	r	f	Oikopleura dioica				r
varicans			f	Oikopleura longicauda				r
Centraugaptilus rattrayi			r	similis			f	f
Centropages furcatus	f			spinirostris			f	f
Copilia lenticulata	r			Oncaea conifera	f			
Corycaeus agilis	f			media	f			
crassiusculus	c	c	c	minuta	a	c		f
latus	f			notopa	r			
punctatus	f	f		tenella	a			
speciosus	a	f	f	venusta	a	a	c	
typicus	f			Paracalanus parvus	a	c	f	r
Eucalanus elongatus		r		Phaenna spinifera		c	r	
Euchaeta marina		c	r	Pontellina plumata	r	r		
Euchirella brevis	f		r	Pontellopsis perspicax	r	r		
Farranula carinata	a	c	f	regalis	r	r		
curta	r			Pseudocalanus minutus		c	f	r
gibbula	c			Rhincalanus nasutus				
gracilis	f			Sapphirina angusta		r		
rostrata			r	Scolecithrix danae		r		
Haloptilus longicornis			r	Spinocalanus abyssalis		r		
ornatus			f	Undinula vulgaris		r		
Heterorhabdus papilliger	r	r	r	Oikopleura nana				r
Labidocera nerii	r							
Lucicutia clausi			r					
flavicornis			a					

STATION 24

Lat. 8° 15' N. Lon. 36° 10' W. Aug. 31, 1928

Bottom depth 3836 m.

Depth, meters	0	50	100	Depth, meters	0	50	100
Temperature, C	27.1	23.1	15.5	Density, σ+P	22.8	29.9	26.8
Salinity, o/oo	35.2	36.0	35.6	Phosphates, mg/m³	8.	8.	99.

Relative abundance				Relative abundance				
Calanus helgolandicus				Acartia longiremis				
minor				Microcalanus pusillus				
Calocalanus pavo				pygmaeus				
stylifer emis				Miracia efferata				
Candacia bispinosa				Oikopleura plumifera				
variacans				similis				
Corycaeus agilis				spinirostris				
crassiusculus				Oncaea media				
limbatus				minuta				
speciosus				venusta				
Euchaeta marina				Paracalanus parvus				
Farranula carinata				Pontellina plumata				
Lucicutia clausi				Pontellopsis perspicax				
Macrosetella gracilis				Pseudocalanus minutus				
Macrosetella clausi				Temora stylifera				
Megacalanus longicornis								

STATION 25

Lat. 11° 02' N. Lon. 37° 06' W. Sept. 3. 1928

Bottom depth 4851 m.

Depth, meters	0	50	100	Depth, meters	0	50	100
Temperature, C	27.4	21.4	14.6	Density, σ+P.	23.0	25.3	27.0
Salinity, o/oo	35.5	36.0	35.7	Phosphates	5.	12.	121.

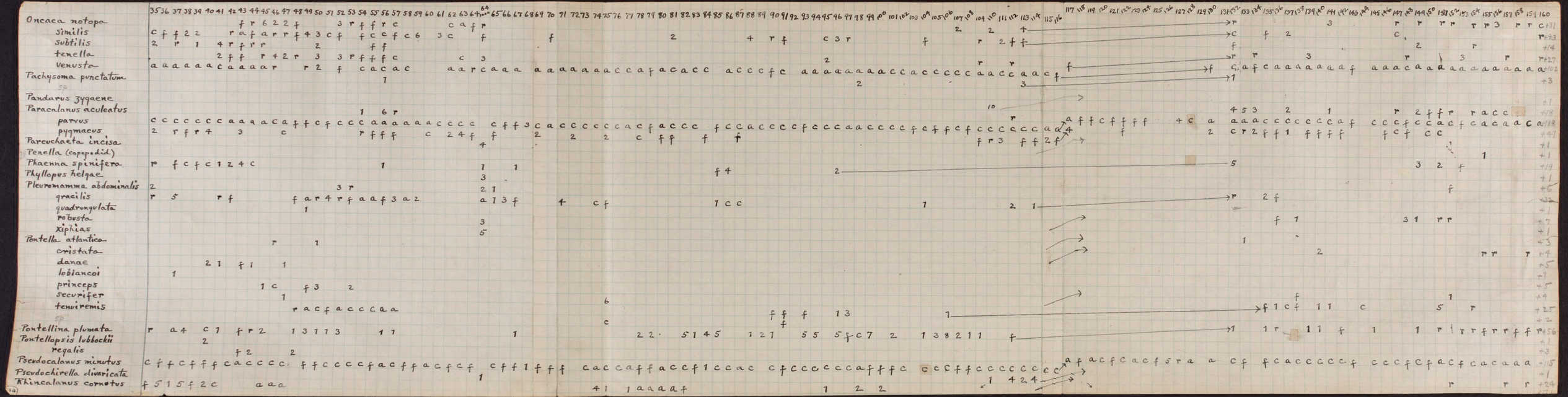
Relative abundance				Relative abundance				
Calanus helgolandicus				Acartia longiremis				
minor				Microcalanus pusillus				
Calocalanus pavo				pygmaeus				
stylifer emis				Miracia efferata				
Candacia bispinosa				Oikopleura plumifera				
variacans				similis				
Corycaeus agilis				spinirostris				
crassiusculus				Oncaea media				
limbatus				minuta				
speciosus				venusta				
Euchaeta marina				Paracalanus parvus				
Farranula carinata				Pontellina plumata				
Lucicutia clausi				Pontellopsis perspicax				
Macrosetella gracilis				Pseudocalanus minutus				
Macrosetella clausi				Temora stylifera				
Megacalanus longicornis								

STATION 26

Lat. 11° 33' N. Lon. 40° 43' W. Sept. 5, 1928

Bottom depth 4492 m

Depth, meters	0	Depth, meters	0
Temperature, C.	27.6	Density σ+P	23.3
Salinity o/oo	36.0	Phosphates, mg/m³	5


Oncaea notopa
similis
subtilis
tenella
venusta
Pachysoma punctatum
Sp
Pandarus zygaene
Paracalanus aculeatus
parvus
pygmaeus
Parevchaeta incisa
Penella (copepodid)
Phaenna spinifera
Rhyllopus helgae
Pleuromamma abdominalis
gracilis
quadrungulata
robusta
Xiphias
Pontella atlantica
cristata
danae
lobiancoi
princeps
securifer
tenuiremis
Sp
Pontellina plumata
Pontellopsis lubbockii
regalis
Pseudocalanus minutus
Pseudochirella divaricata
Rhincalanus cornutus

STATION 21

Lat. 15°50'N. Lon. 37°52'W. Aug. 24, 1928

Bottom depth 4977 m.

Depth, meters	0	50	100	Depth, meters	0	50	100
Temperature, C	26.5	24.4	21.0	Density σ_t	23.8	24.7	26.2
Salinity ‰	36.28	36.2	36.7	Phosphates mg/m³	4.	4.	7.

Relative abundance

Acartia longiremis	f		Metridia lucens	f	
Calocalanus pavo	f		Oithona plumifera	p	
Candacia bispinosa	r		similis	f	f
Corycaeus speciosus	f		Oncaea media	f	
Eucalanus attenuatus	r		Sapphirina angusticaudata	r	
Euchaeta marina	f		Undinula vulgaris	a	
Lucicutia flavicornis	f				
Metridia brevicauda	f				

STATION 20

Lat. 19°13'N. Lon. 38°28'W. Aug. 22, 1928

Bottom depth 5626 m.

Depth, meters	0	Depth, meters	0
Temperature, C	26.0	Density σ_t	24.2
Salinity ‰	36.5	Phosphates	5

Relative abundance

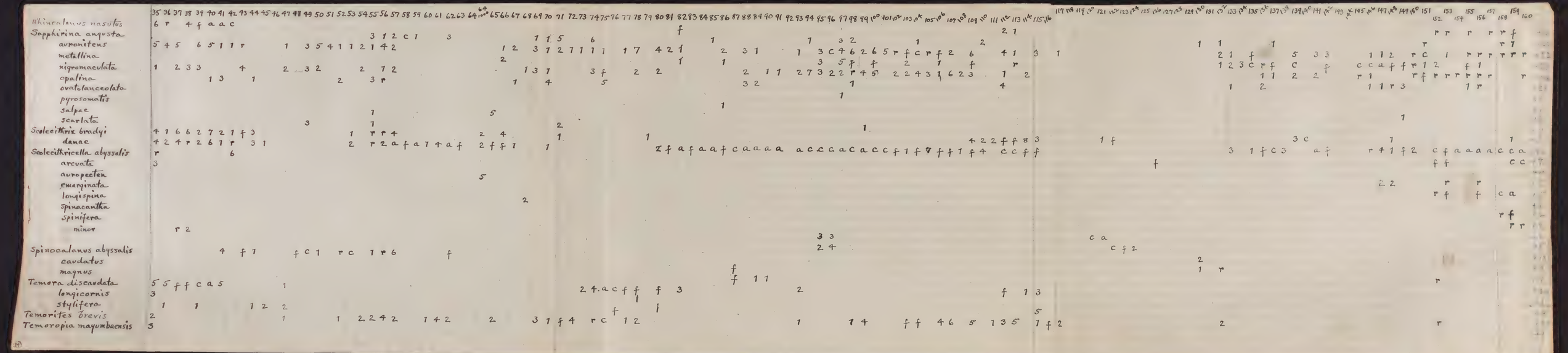
Acartia longiremis	r	Farranula curvirostra	a
Calocalanus paro	f	gibbula	f
stylifemis	f	rostrata	f
Candacia bispinosa	r	Macrosetella gracilis	f
Corycaeus dubius	2	Oncaea minuta	f
speciosus	f	Paracalanus parvus	a

BETWEEN STATIONS 20 & 21

Lat. 16° 01'N. Lon. 37° 52'W. Aug 23, 1928.

- surface tow -

Acartia longiremis	f	Farranula gibbula	f
Calanus minor	a	gracilis	f
propinquus	f	rostrata	f
Calocalanus paro	f	Lucicutia clausi	a
Candacia bispinosa	f	longicornis	f
simplex	r	Miracia efferata	f
Centropages furcatus	r	Oncaea venusta	a
Corycaeus clausi	1	Paracalanus parvus	c
speciosus	f	Pleuromamma xiphias	r
typicus	f	Pseudocalanus minutus	c
Euchaeta marina	f	Sapphirina auronitens	f
Euchirella brevis	r	Scolecithrix danae	a
Farranula carinata	a	Undinula vulgaris	a


Rhincalanus nasutus
Sapphirina angusta
auronitens
metallina
nigromaculata
opalina
ovatolanceolata
pyrosomatis
salpae
scarlata
Scolecithrix bradyi
danae
Scolecithricella abyssalis
arcuata
auropecten
emarginata
longispina
spinacantha
spinifera
minor
Spinocalanus abyssalis
caudatus
magnus
Temora discaudata
longicornis
stylifera
Temorites brevis
Temoropia mayumbaensis

Lat.

depth 4112 m

‰ C.

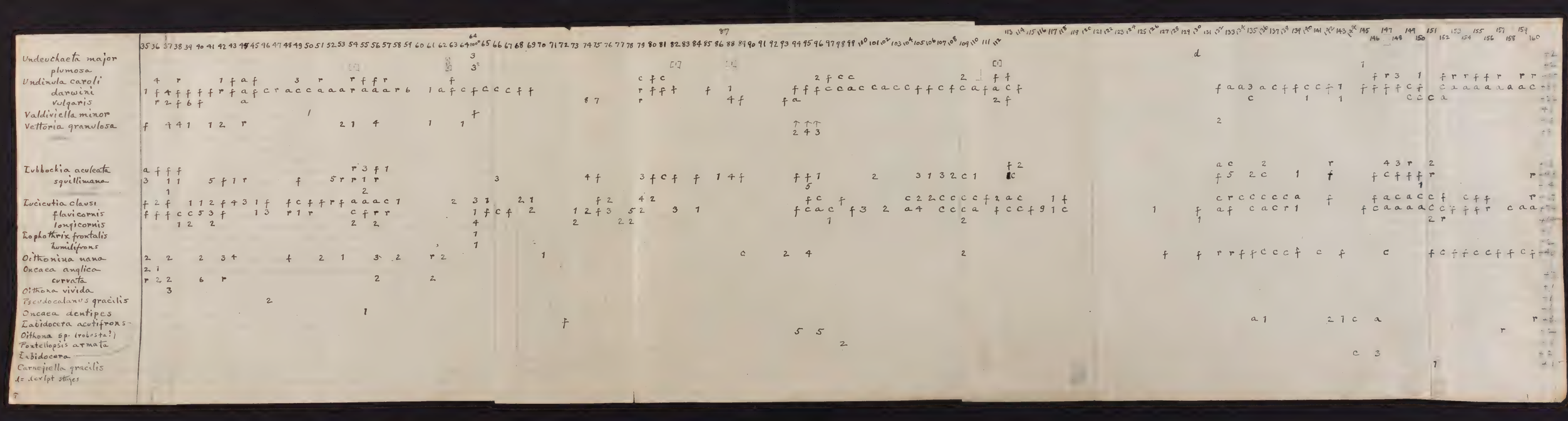
mg/m³ O+P

Lat.

depth 4054 m

‰ C.

mg/m³ O+P


Undeuchaeta major
plumosa
Undinula vulgaris
darwini
vulgaris
Valdiviella minor
Vettoria granulosa
Lubbockia aculeata
squillimana
Lucicutia clausi
flavicornis
longicornis
Lophothrix frontalis
humilifrons
Oithona nana
Oncaea anglica
curvata
Oithona vivida
Pseudocalanus gracilis
Oncaea dentipes
Labidocera acutifrons
Oithona sp. (robusta?)
Fontellopsis armata
Labidocera
Carnejiella gracilis
d= devlpt stages

STATION

Lat. 1 N.

Bottom depth 892 m.

Temp. °C	8.1	8.3		σ/P		5	9
‰	34						

STATION

Lat. 54° N. Lon. 34° W. July

Bottom depth 3031 m.

Depth, meters	50	100		Depth, meters	0	50	100
Temperature, °C	10.6	10.6	6.6	Density, σ/P	26.9	27.1	27.9
Salinity ‰	34.7	34.7	35.0		mg/m³	51.	52.

Anomalina pelagica	2			Globigerina bulloides			a
Calcarina hispida		a		Spirillina			f
Epistomina mexicana		r		Textularia			a
Pulvinulina norvegica		a	a	Pseudoparrella variabilis			c

STATION

Lat. 54° N. Lon. 34° W. Aug. 1, 1928

Bottom depth 2633 m.

Temperature, °C	10.1	7.2	6.8	Density, σ/P	26.7	27.6	28.0
Salinity ‰	34.1	34.1	35.0		mg/m³	21.	

Anomalina pelagica	a			Pulvinulina norvegica		2	f
Calcarina hispida	a			Globigerina bulloides			a
Epistomina mexicana	r			Spirillina			r
Pulvinulina norvegica	f			Textularia			var
Melonis barleeanus	r			Pseudoparrella variabilis			c

Lat. 54° 21' N. Lon. 10° 20' W. July

Globigerina bulloides	c	Pulvinulina norvegica	c
Anomalina pelagica	c	Calcarina hispida	f
Cassidulina laevigata	f	Pseudoparrella variabilis	a
Globigerina bulloides	f	Spirillina	f
Melonis barleeanus	r	Textularia	r
Pulvinulina norvegica	a		

STATION 7

Lat. 63° 20' N. Lon. 9° 25' W. July 13 1928

Bottom depth 454 m.

Temperature, °C	8.8	8.2	8.1	Density, σ/P	27.3	27.7	27.9
Salinity ‰	35.1	35.2	35.2		34.	34.	34.

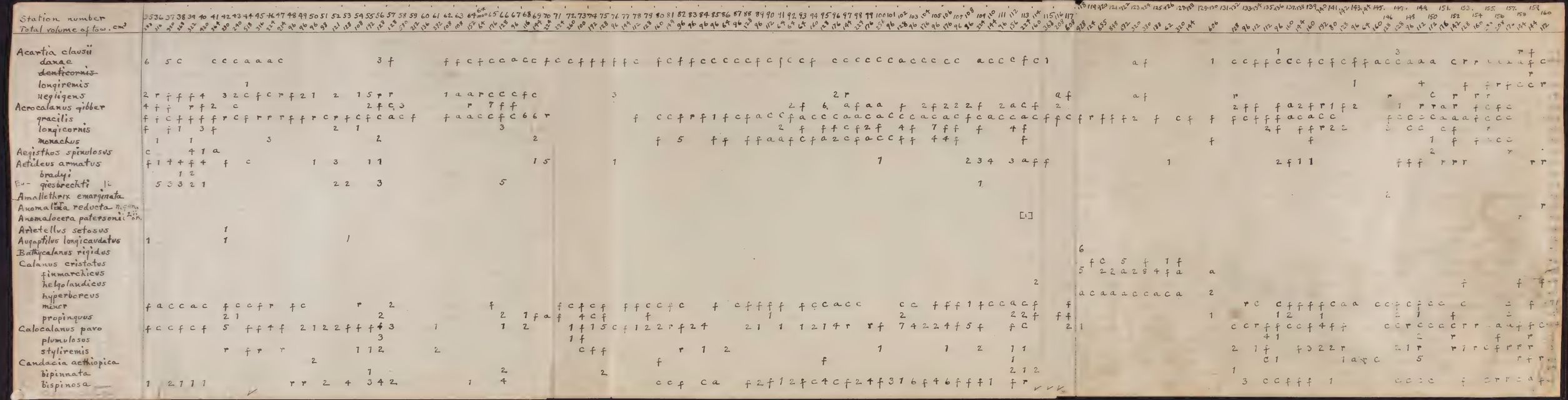
Anomalina pelagica	c			Cassidulina laevigata			r
Calcarina hispida		a		Globigerina bulloides			r
Melonis barleeanus	r	a	c	Pulvinulina norvegica		c	f
Cassidulina laevigata	r	r		Textularia		a	f
Spirillina		c	f				

STATION 8

Lat. 61° N. Lon. 21° W. Sept 16, 1928

Bottom depth 1369 m.

Temperature, °C	6.7	7.0	7.4	Density, σ/P	27.0	27.5	27.9
Salinity ‰					mg/m³	19.	19.


Station number
Total volume of tow, cm³
Acartia clausii
dana
denticornis
longiremis
negligens
Acrocalanus gibber
gracilis
longicornis
monachus
Aegisthos spinulosus
Aetideus armatus
bradyi
Eu- giesbrechti
Amallothrix emarginata
Anomalocera reducta
Anomalocera patersoni
Arietellus setosus
Augaptilus longicaudatus
Bathycalanus rigidus
Calanus cristatus
finmarchicus
helgolandicus
hyperboreus
minor
propinquus
Calocalanus pavo
plumulosus
styliremis
Candacia aethiopica
bipinnata
bispinosa

Calocalanus [illegible]			2		[illegible]						
Candacia [illegible]					[illegible]						
Candacia pachydactyla		1			[illegible]						3
Clausocalanus [illegible]	1				[illegible]				1	2	
[illegible]	1				[illegible]						
Clytemnestra rostrata			1		Pontella [illegible]				3	f	
Eucalanus [illegible]			1		[illegible]						
elongatus			4		[illegible]					2	
Heterostylites [illegible]			1		Pontellina plumata				1	2	
Lucicutia clausi			1		Pontellopsis [illegible]				1		
Mecynocera clausi		2	2		Sapphirina [illegible]						1
Megacalanus [illegible]			3		Sapphirina angusticaudata						1
[illegible]		2			Undetermined [illegible]						f

STATION 67

Lat. [illegible] Long. [illegible] W. June 1921

Bottom depth = 1089m

Depth, meters	0	50	100	Depth, meters	0	50	100
Temperature, C.	[illegible]	[illegible]	16.2	Density, σ_t P.	24.9	25.4	25.8
Salinity, o/oo	[illegible]	[illegible]	34.6	Phosphates mg/m^3	21	20.	23.
Volume of tow, cm^3	32	32	32	Length of tow, miles	0.3	0.3	0.3

	0	50	100		0	50	100
Acartia danae	a	a		Namdocalanus minor			1
negligens	c	f	c	Racovalanus gracilis			c
Acrocalanus gibber		2	f	robustus		2	c
gracilis	c	c	f	tenuicornis			f
Candacia bipinnata			2	Calanus [illegible]		3	f
Clausocalanus arcuicornis	f	f	c	fabia	2		c
furcatus	f			Selagina			3
Clytemnestra rostrata			4	Similis		f	c
scutellata			3	spinicornis		f	f
Corycaeus anglis	f			Eucalanus [illegible]	2		
crassicaudatus		2		minutus	3	f	
crassus	2			venustus	2	c	a
longistylis			4	Paracalanus parvus	f	f	f
pacificus			2	Pharenna spinipes			f
typicus		2	f	Pleuromamma [illegible]			f
Farranula carinata	2	c	f	Pontellina plumata			f
gibbula	r			Pontellopsis regalis		f	f
rostrata		f	c	Sapphirina angusticaudata			2
Haloptilus longicornis			1	nigromaculata			1
Lucicutia flavicornis		2	f	Scolecithrix danae		1	
Mecynocera clausi		2	c	Undinula darwinii		3	c
Microsetella norvegica			2				

STATION 66

Lat. 27° 04' S. Lon. 84° 01' W. June [illegible]

Bottom depth = 3812

Depth, meters	0	50	100	Depth, meters	0	50	100
Temperature, C.	19.4	17.8	17.8	Density, σ_t P.	24.6	25.4	25.7
Salinity, o/oo	34.6	34.8	34.9	Phosphates mg/m^3	29.	29.	21.
Volume of tow, c.m^3	64	64	64	Length of tow, miles	1.7	1.7	1.7

	0	50	100		0	50	100
Acartia danae	c		2	Heterostylites papillifer			3
negligens	c		4	Lubbockia squillimana			3
Acrocalanus gibber	s		f	Lucicutia flavicornis			c
gracilis	f		f	Mecynocera clausi	c		c
longicornis			3	Microsetella norvegica			f
Actideus giesbrechti			5	Nannocalanus gracilis			f
Calanus propinquus			2	robustus			f
Calocalanus pavo			1	tenuicornis	f		f
Candacia bipinnata			2	Oithona attenuata		f	f
bispinosa			4	plumifera	a		f
longimana			5	similis			f
simplex			4	spinirostris			f
Clausocalanus arcuicornis	c			Oncaea media	c		a
Corycaeus flaccus			f	venusta	c		a
latus	f			Paracalanus parvus			f
longistylis	f		4	Pleuromamma gracilis			f
pacificus			5	Pontellopsis micrura	f		f
pumilus	x			Sapphirina angusticaudata	f		
typicus	s		s	Scolecithrix bradyi			4
Euchaeta acuta				danae			f
Farranula carinata	c		c	Undinula darwinii	c		c
rostrata	c		c	Sapphirina metallina			2
Gaidius tenuispinus			2				

	1	½	2	3	4	5	6	6/7	6/7	7	8	9	10	11	12	13	13/14	14	15	16	17	18	19	20	20/21	21	22	23	24	25	26	27	28	29	30	31	32	33	34	39
Pontella lobiancoi								r			r																											r			3
securifer																																						r		1
atlantica																																					r			1
Pontellina plumata	2		r														r		r	r		r				r	r		f		r					r		r	12
Pontellopsis perspicax																				r							r		r		r	r		r	r					7
regalis																											r	r													2
Pseudocalanus minutus	c				r	f	f	c	f	c	c		c		r	c	c	c		a		c	c		c	c	f	c	c	c		c	c		c	a	a	f	f	29
Rhincalanus cornutus	r	r	r				c	f										r	r										r				r	r	f	f			c	13
nasutus	r	a	a	r		f	f	f										r	r	r		r	r					r								f	c	r	c	17
Sapphirina angusta	r		2	r	r	f	r										f	f					r					r											r	11
auronitens	f		r																			r	f		f											r				6
darwini		r																																						1
nigromaculata	f	r	f	r	f	r																										r	r							8
scarlata																																						r		1
stellata					r	r		r																																3
~~Scolecitricella~~		#																																						1
Scolecithrix danae	f	c		c	c							r						f							a	r	r	a	a			f	f	f	f	f	c		a	18
minor															c	c																									2
Spinocalanus abyssalis																										r	r												r		3
Temora longicornis	c	r	r						a	a							4	f																		f	a	r		10
stylifera	a	a	c														f	f											f		f			f		a	f	c		11
Undinula vulgaris	f	c	r																							r	a	r	c	a		r		f	r		r	r	c	14
Megacalanus princeps		f																																						1
Candacia falcifera																											2													
Scolecithricella ovata												r																												

17 out in Pacific
254 in Pacific
273 Total

23 131 Total

	1	½	2	3	4	5	6	6/7	6/7	7	8	9	10	11	12	13	13/14	14	15	16	17	18	19	20	20/21	21	22	23	24	25	26	27	28	29	30	31	32	33	34	39
Lucicutia longicornis																						r	c		f															3
Macrosetella gracilis	c	f	c				r	r									r			c		f	f	f		r	c	f	c	f	c	a	a	c	c	a	c	c	c	24
oculata																				r	r		r											r	r				r	6
Mecynocera clausi	r	c	f	f	c	c	r											a	f	c		f	r			r	r	r	f	r		r	r	f	f	r	r	r	f	25
Megacalanus longicornis	f															r							r			r	c	r	a	c		f	r	f					f	12
Metridia curticauda							r		r																															2
longa								f								f												r												3
lucens														r																										1
Microcalanus pusillus																	f	f			f	c	f			f	f	f	c	f		f	r	r	r	f	f			16
pygmaeus																													f	r										2
Microsetella norvegica	c	r	f			a	a	a	a	f	a	a	a	f	a	f	r	r	f	f	r	f	f				r	c	c			a	a	c	c	c	c	c	c	32
rosea	r						r													r													r	c	c	c		r	f	9
Miracia efferata	5	r	r																	c		r	r		f		f	a	c		f			r						12
Neocalanus gracilis																		a	r	f	f																			4
tenuicornis																		a	f	r	f																			4
Oithona hebes																																		r						1
																																								3
setigera				r		f	f	r	r		f																r								r					6
plumifera	c	a	f	c	c	f	c	f	f	c	f	c										r				r			f		a	r		f	f	r	r	c	22
similis	1	c	f	f	c	a	a	a		c	a	a	a	a	a		a	a	a	c	a	a				a	f	f	c	r		a	c	c	c	a	c	r	a	34
spinirostris	r	r											f	r	a	f		r	r	c	c	a				f	a	f	f	r		a	r	f	c	c	f		f	23
Oithonina nana								f	f		r		f	a	a		a						f				a	r	f			a				f	f		r	15
Oncaea conifera																										f		f									f			3
curta		f																								3								f	r				4
media		c	c					f									f				a	r				c		c	f	f				f	f		r		13
minuta	r	f	c	c		f	f	c									c		c	f		a	c	r		f	r	a	a	a		c	c	c	f	c	c	f	r	26
notopa																										1		r	r						r						4
similis		r	f																								a													3
subtilis																																			f		r			2
tenella																										1	2								r	r			r	5
venusta	c	c	c	c		r	c	c		r							f	a	a	r	a	a	a		a	a	a	a	a	a	f	a	a	a	a	a	a	c	a	30
Pachos punctatum		2																																						7
Paracalanus parvus	f	c	c	f	f		c	a	a	c					c	c	f	a	a	f		c	c	r	c	c	c	c	c	c		f	c	c	c	a	a	r	f	32
Phaenna spinifera	c	a	r																									c	f			f		r	f	f	f		c	11
Pleuromamma gracilis																	a																							7
xiphias																									r															1

	1	½	2	3	4	5	6	6/7	6/7	7	8	9	10	11	12	13	13/14	14	15	16	17	18	19	20	20/21	21	22	23	24	25	26	27	28	29	30	31	32	33	34	39
Corycaeus limbatus		r																		f									f						r					4
minimus	r																																				r	r			3
ovalis	r																																								1
pumilus																						f	f			a	f									r					5
speciosus	a	a	a																f	c	a	a	a	f	f	r	f	a	f	a	f	a	c	c	a	c	a	f	c	24
typicus	c	f	f																f						f			f	f				f			f				9
Drepanopus pectinatus					r																																			1
Eucalanus attenuatus		r																																						1
elongatus		f	f	f					f						r	c		r										r	c			r					c	r	f	13
Euchaeta grandiremis																													r											1
marina	c	f	r										r							r			r		f	f	f	c	a	c		f		f	f	c	a	f	a	19
Pareuchaeta tonsa														a	f																									2
Euchaetopsis	2																																							1
Euchirella brevis																		r	r		r	r		r				f	c			r	r							9
curticauda	f																																							1
pulchra	c																																r							2
rostrata												1		r									r				r													4
Farranula carinata	c	c	a	r		r		1									r	r	a	a	a	a	a	a	a	a	a	a	a	a	f	c	c	c	c	c	c	f	c	29
curta		r	f																									r								r				4
gibbula	f	r	c			f													c	f	f	f	c	f	f	f	f	c	c			f	r	f	f	f		f	f	22
gracilis	f																								3			f												3
rostrata	f	c	c	f				3									r	f	f	c	c	c	r	r	f	f		r	f			f	c	r	r	c	c	f	c	25
Gaidius brevispinus											r																													1
Haloptilus longicornis																		r	c	r	r	c	a			r	r	c				c								10
ornatus																							r					f	c				c	c	c	f	c		f	9
plumosus																							r																	1
spiniceps																																		r						1
Heterorhabdus norvegicus														f																										1
papillager																			f									r	r											3
Labidocera nerii Wolk.				r																								r				f		r					4
wollastoni Lubb.									r																										r					2
Lubbockia aculeata																			2																					1
squillimana																			r		r	f	r										r		c		r	r	8
Lucicutia clausi		r																			f	c	f		a		f	r	a	f		f	c	f	r				13
flavicornis		f																	a	r	c	c	a				r	a	c			f	c		c	c	c	a	c	16
grandis																																				r				1

i or ii

	1	½	2	3	4	5	6	6/7	6/7	7	8	9	10	11	12	13	13/14	14	15	16	17	18	19	20	20/21	21	22	23	24	25	26	27	28	29	30	31	32	33	34	Total
Acartia clausii (OK 2ii)		r				f	c	a	a	c	r																					r						f	9
longiremis			4	f		f												r	f		f	r	f	r	f	f	c	a	c	a		a	r			f	c		19
Aetideus armatus																		f				r	r						r				r				r	r	r	8
Anomalocera patersonii (2ii OK.)												c	2																											2
Calanus finmarchicus										a	c	a	a	a	a	a		c																						8
helgolandicus			f	a	r	c	r			a	a	f			a	f		r			c	a	a			a	c	a	a	c		a	c	c	c	a	c	r	r	27
minor	c	a	c	f	a	f			f			f				f	c	c	c	c	c	c	c			a	a	c	c	a	c		a	c	c	c	c	a	r	c	30
propinquus	f																									f	r		a					f	c	f		r	r		9
Calanopia americana																																r				r	r			3
elliptica																																					r			1
Calocalanus pavo	f	f	f		r	r												r	f	f		f	c	f	r	2		r	f	f	c	f	c	c	a	r	r		f	24
styliremis																		f	r	r			c	f		f			r	r					c	f				10
Candacia aethiopica		r																			r						r					r							3
bispinosa		f		r			r													r	r		f	r	f	a	r	a	c	c		f	r	r	f	r	r	r	r	21
norvegica	f																	r	r				f						r							f	r		r	8
pachydactyla																													f			f	r	r	r	r	r			7
simplex																			c		f	f	r		r			f	f			f				f	f			10
varicans																												f	f	r										3
Centravgaptilus rattrayi																												r												1
Centropages chierchiae				3																																				1
furcatus	r	r		r		r	r	r										c	f	r	r	f	r		r		r	f	r			r	r	r		f			20
hamatus								r	a									r					r									r				f			6
typicus							r																																	1
violaceus																		f	f		r																			3
Clausocalanus arcuicornis	c	f		r	r	c	a	r	f								r	a	a	f	f		f		r							r			f	r		c	19
Clytemnestra rostrata											r																													1
scutellata	f	r																					r					f		f		a	r	r	r		r		10
Copilia denticulata	f	r	r																				r				r								r	r		r		8
Corycaeus agilis			r														r									f		c				r						f		6
anglicus	f	f																															2			r	f			5
clausi																									1											r				2
crassiusculus	c	c	a														f		c	f	c	a	f			f	c	f	a	f	f	f	f	a	a	f	f	c	22
dubius																								2		f								r		r				4
flaccus	f	f	f																																	r				4
furcifer																																				r			1
lautus	f																		f			1				2	4							r		2			7

B E T W E E N S T A T I O N S 53 & 54

(28 species)

Anchorage, Hanga Roa, Easter Island, Dec. 10 &12, 1928

Surface only, 4 tows

Acartia negligens	2	Neocalanus gracilis	3
Acrocalanus gracilis	r	Oithona attenuata	1
Calanus minor	r	similis	1
Clausocalanus arcuicornis	f	Oncaea minuta	2
furcatus	c	tenella	3
Corycaeus speciosus	1	Paracalanus aculeatus	1
Farranula carinata	c	parvus	a
curta	4	Pontella princeps	2
gibbula	c	tenuiremis	a
gracilis	2	Pseudocalanus minutus	f
rostrata	c	Sapphirina auronitens	1
Mecynocera clausi	r	Undinula darwini	r
Microcalanus pygmaeus	2	Corycaeus lautus	1
Microsetella rosea	3	Calocalanus plumulosus	3

REMARKS. The time of these tows was not recorded but all four were on the same date. Like the two preceding tows they were all in shallow water near the anchorage, and did not yield any littoral species. Nine of the species here recorded were not obtained in the two previous tows, while eighteen of the species present in those two tows do not appear here. Calanus and the two Pontella species are the most noteworthy additions in these four tows, all three of them pelagic forms.

S T A T I O N 55

(82 species)

do 32° 03' S. 110° 55' W. Dec. 16, 1928

Bottom depth 2725 m.

Depth of tow,m.	0	50	100	Depth of tow,m.	0	50	100
Temperature,C.	20.3	18.7	16.7	Density, σ_t	24.6	25.3	25.9
Salinity, o/oo	34.9	35.0	34.8	Hydrogen ion pH	8.19	8.18	7.7
Volume of tow, cm^3	32	64	96	Length of tow,miles	0.3	0.8	1.4
Acartia negligens	1	1	3	Lucicutia clausi		a	a
Acrocalanus gibber			2	flavicornis		r	f
gracilis	r	f	r	Mecynocera clausi		f	a
Aetideus armatus			1	Megacalanus longicornis			1
Calocalanus pavo		3	f	Microcalanus pusillus			f
styliremis			1	pygmaeus			r
Candacia bipinnata			1	Neocalanus gracilis	f	c	c
bispinosa			3	robustior		c	f
norvegica			1	tenuicornis			3
simplex		4	r	Oithona attenuata	4	f	
truncata			1	brevicornis			2
Clausocalanus arcuicornis	2	c	f	similis		c	a
furcatus		f	c	spinirostris		f	c
Copilia denticulata		4		Oncaea curta			f
quadrata			2	dentipes			1
vitrea			3	media		c	c
Corycaeus catus	4	r	r	mediterranea			3
crassiusculus			f	minuta		a	a
flaccus			r	notopa	2	r	f
lautus		r	r	similis		f	c
limbatus		f	r	subtilis			f
longistylis			2	tenella	2	r	f
pumilus	3			venusta		f	a
robustus			1	Paracalanus parvus	f	a	a
typicus		a	c	pygmaeus			f
Eucalanus crassus			1	Pleuromamma gracilis		a	2
Euchaeta acuta			r	Pontella tenuiremis	c		
Farranula carinata	r		f	Pseudocalanus minutus	r	r	f
concinna	r			Sapphirina angusta		1	2
curta	1		c	auronitens			1
gibbula	c	c	f	opalina			3
gracilis	3		r	salpae			1
rostrata	r	c	c	scarlata			1
Haloptilus longicornis		f	1	Scolecithricella bradyi		2	r
Lubbockia aculeata		3		Scolecithrix danae			r
squillimana		1		Spinocalanus abyssalis			1
attenuata		2		Calocalarus plumulosus		2	
Undinula caroli			f	Undinula darwini		r	a
Augaptilus filigerus			1	Canthocalarus pauper		3	
Candacia longimana		3		Phaenna spinifera		46	
Centropages hamatus	1			Scolecithricella auropecten			f

REMARKS.

The temperature at the surface was moderate, and dropped 17% ~~ing a degree and a half at 50 meters and two degrees more at~~ in 100 meters: the salinity ~~was moderate and~~ remained fairly constant while the hydrogen ion diminished ~~one point~~.

There were nineteen species at the surface, forty-one species in the 50-meter tow and sixty-four species in the 100-meter tow. Forty-six species (56%) were each confined to a single tow and ten species were present in all three tows.

do

S T A T I O N 57

(80 species)

33° 59' S. 106° 43' W. Dec. 20, 1928

Bottom depth 3139m.

Depth of tow,m.	0	50	100	Depth of tow,m.	0	50	100
Temperature,C..	18.9	15.5	14.3	Density, σ_t.	24.6	25.5	26.1
Salinity, o/oo	34.4	34.3	34.3	Hydrogen ion pH	8.14	8.14	8.12
Volume of tow, cm^3	48	32	48	Length of tow,miles	1.2	1.2	1.2
Acartia danae		f	f	Macrosetella oculata			1
negligens		r	2	Mecynocera clausi		c	a
Acrocalanus gibber		c	r	Megacalanus longicornis			3
gracilis		a	c	Microcalanus pusillus		c	f
Calanus minor		2		pygmaeus		f	
Calocalanus pavo		3		Microsetella rosea			1
Candacia bispinosa			2	Miracia efferata			1
simplex			f	Neocalanus gracilis		c	c
Centropages calaninus			2	robustior		c	f
Clausocalanus arcuicornis		c	a	tenuicornis			c
furcatus		c	a	Oithona attenuata		r	r
Clytemnestra rostrata			1	brevicornis			2
Copilia denticulata			1	plumifera			3
quadrata			1	similis		a	a
Corycaeus catus	2	5	f	spinirostris		f	f
clausi			1	Oithonina nana		r	r
crassiusculus		f	f	Oncaea media		c	c
flaccus		4		mediterranea		f	f
furcifer			5	minuta		c	a
lautus		c		notopa		c	r
limbatus		r		similis		f	f
longistylis		c		tenella		c	
pumilus	f	r		venusta		a	a
typicus		c	c	Paracalanus aculeatus		2	r
Eucalanus crassus			1	parvus		c	a
elongatus			1	pygmaeus		r	f
mucronatus			1	Pleuromamma gracilis			3
Euchaeta acuta			c	Pontella tenuiremis	a		
Euchirella brevis		2		Pontellina plumata		1	
Farranula carinata		c	r	Pseudocalanus minutus	r	c	c
curta		a	a	Sapphirina angusta		16	12
gibbula			r	auronitens			2
gracilis			1	nigromaculata			2
rostrata		c	c	Scolecithricella bradyi		4	
Haloptilus longicornis			1	Scolecithrix danae		a	a
plumosus			1	Spinocalanus abyssalis		3	3
Lubbockia aculeata		1		Calocalanus plumulosus			2
Lucicutia clausi			c	Undinula caroli		r	r
flavicornis			r	darwini		a	a
Phaenna spinifera			1	Pontella danae			4

REMARKS.. The moderate surface temperature drop^ped three degrees at 50 meters and another degree at 100 meters, the salinity and hydrogen ion ~~are~~ were fairly high and remain^ed constant.

Only four species appeared in the surface tow, forty-eight in the 50-meter, and sixty-six in the 100-meter tow. Forty-four species (55%) were

do

S T A T I O N 58 (36 species)

36° 51' S. 104° 05' W. Dec. 22, 1928

Bottom depth 3810 m.

Depth of tow,m.	0	50	100	Depth of tow,m.	0	50	100
Temperature,C.	16.9	14.8	12.3	Density, σtP.	24.7	25.4	26.3
Salinity, o/oo	33.9	34.0	34.0	Hydrogen ion pH	8.12	8.12	8.09
Volume of tow, cm^3	448	36	96	Length of tow,miles	1.3	1.3	1.3
Acrocalanus gibber			3	Neocalanus gracilis	1	c	
gracilis		c		robustior		f	f
Clausocalanus arcuicornis		c		tenuicornis		f	
furcatus		c	a	Oithona brevicornis			2
Corycaeus crassiusculus		r	r	similis			c
pumilus		3		spinirostris			1
typicus			1	Oithonina nana		2	
Eucalanus elongatus		2		Oncaea conifera			1
Euchaeta acuta			f	media		c	
Euchirella rostrata			1	minuta		a	c
Farranula curta		f		similis		r	c
Lucicuta clausi			1	venusta		f	c
Mecynocera clausi		r	1	Paracalanus parvus	5	a	a
Megacalanus longicornis			1	Pleuromamma gracilis			a
Microcalanus pusillus		f	f	Pseudocalanus minutus	2	r	f
pygmaeus		f	f	Sapphirina angusta			c
Canthocalanus pauper		1	1	Scolecithrix danae		f	f
Farranula rostrata		r		Undinula darwini	1	r	

REMARKS. From a low surface temperature there was a drop of four and a half degrees in the upper 100 meters, while the salinity and hydrogen ion remained moderately high and constant. Four species only appeared at the surface, twenty-four in the 50-meter tow and twenty-five in the 100-meter tow. Twenty-one species (60%) were each confined to a single tow and only two species were found in all three tows. To account for the very small number of species found at the surface it is shown elsewhere that the combination of a rather low temperature and a moderate salinity is not favorable to the copepods..

But a better reason is found in the fact that the great bulk of this tow was made up of Ctenophores. These feed upon copepods amongst other creatures and when they swarm in large numbers, as they were doing here, they would naturally reduce the number of the copepods. This would also help to explain the great drop in the number of species from 108 at Station 56 and 80 at Station 57 down to the 36 species here.

do

B E T W E E N S T A T I O N S 60 & 61 (16 species)

A. 40° 26' S. 97° 12' W. Dec. 26, 1928, 4.50 to 5.50 PM
B. 40° 22' S. 97° 02' W. Dec. 26, 1928, 7.20 to 10.20 PM
C. 40° 22' S. 96° 59' W. Dec. 26, 1928, 10.25 PM to 1 AM

Surface only

Location of tow Volume of tow, cm^3	A 64	B 36	C 288	Location of tow Length of tow, miles	A 3	B 1.8	C 1.6
Acrocalanus gracilis	r			Oncaea curvata			f
Clausocalanus arcuicornis	a		f	similis			f
furcatus	c		f	Paracalanus parvus	c		c
Microsetella rosea			r	Pleuromamma gracilis			r
Neocalanus gracilis			r	Pseudocalanus minutus	c		c
Oithona brevicornis	a	f	r	Scolecithrix danae			f
similis	f		c	Undinula darwini			r
Calanus tonsus		f	f	Undeuchaeta major			1

REMARKS. These three surface tows were taken the same night but a few miles apart- The first tow from 5 to 6 in the late afternoon yielded seven species - the second tow from 7 to 10 in the evening yielded only two species and the third tow over midnight yielded fifteen species. It is also worthy of note that the third tow, although shorter than the second, yielded a volume eight times as large and this volume was four and a half times that of the first tow although the latter was twice as long. That the midnight tow should contain twice the number of species of either of the others is however exactly what would be expected as a result of nocturnal migration.

The species found in it that were not present in the other tows are the ones that require a longer time to reach the surface. This may be due to slower progress or to a longer distance traversed, Undeuchaeta probably coming under the latter alternative, while Oncaea might well represent the former.

Clausocalanus and Oithona comprised 99% of the first tow, the second tow was evenly divided between Oithona and Calanus, while no single species of the third tow stood out with any prominence. Nine of the species (56%) were each confined to one of the tows and not found in the other two, and only a single species was present in all three tows. These three tows thus present considerable diversity in the surface distribution of the copepods.

do

S T A T I O N 61

(26 species)

38° 29' S. 94° 14' W. Dec. 28, 1928

Bottom depth 3299 m.

Depth of tow,m.	0	50	100
Temperature,C.	16.9	14.0	10.7
Salinity, o/oo	34.0	33.9	34.0
Volume of tow, cm³	320	36	36
Calocalanus pavo		1	
styliremis			2
Clausocalanus arcuicornis	f		f
Eucalanus mucronatus			1
Euchirella brevis		4	c
Farranula curta		1	
gibbula		1	
rostrata		2	
Heterorhabdus papillager			2
Mecynocera clausi		a	c
Microcalanus pygmaeus		1	
Neocalanus gracilis	1		f
Heterostylites longicornis			1

Depth of tow,m.	0	50	100
Density,, σtP.	24.8	25.6	26.5
Hydrogen ion pH	8.05	8.05	8.03
Length of tow, miles	1.5	1.1	1.1
Neocalanus tenuicornis			1
Oithona brevicornis			f
similis		c	a
spinirostris		c	a
Oithonina nana			r
Oncaea curvata			2
similis		3	
Paracalanus parvus	c	r	r
Pseudocalanus minutus	c	f	c
Scolecithrix danae			4
Calocalanus plumulosus		f	4
Undinula darwini			1
Vettoria granulosa			1

REMARKS: The temperature was still low at the surface and dropped six degrees in 100 meters - the salinity and hydrogen ion were moderate and constant. Four species were found at the surface, thirteen in the 50-meter tow and twenty in the 100-meter tow. Seventeen species (65%) were each confined to a single tow and only two were present in all three tows. The length of the surface tow was four-tenths greater than the other two tows but its volume was nine times as large. Since it contained but 4 copepod species, one of which was represented by a single specimen, its bulk was manifestly due to constituents of the plankton other than the copepods. Although the 50-meter tow contained thirteen species, more than 90% of its copepods were the single species of Mecynocera. Similarly development stages of the three species of Oithona made up a large portion of the 100-meter tow.

do

B E T W E E N S T A T I O N S 61 & 62

(36 species)

A. 37° 34' S.. 93° 35' W. Dec. 29, 1928.
B. 37° 35' S.. 93° 35' W. Dec.. 28, 1928.

Surface only

Location of tow Volume of tow, cm³ Time of tow A. 2–2.45 AM	A 32	B 36	Location of tow Length of tow, miles Time of tow B. 11.50PM–2 AM	A 2.2	B 0.4
Acartia danae	1		Oncaea media	f	f
Acrocalanus gracilis		1	mediterranea	f	f
Candacia simplex	1		minuta	f	c
Clausocalanus arcuicornis	a	c	notopa		r
furcatus	a	c	similis	f	c
Corycaeus agilis	f	1	venusta	c	a
catus	c	2	Paracalanus parvus	a	f
crassiusculus	f	2	pygmaeus		1
pumilus	a		Pleuromamma gracilis	1	c
Farranula rostrata	f	1	Pseudocalanus minutus	c	c
Microcalanus pusillus	3	r	Sapphirina angusta	2	1
pygmaeus	1		auronitens	1	
Microsetella rosea	f	c	Scolecithricella bradyi	c	3
Neocalanus gracilis	2	r	Scolecithrix danae	c	f
robustior	1		Spinocalanus abyssalis	c	c
Oithona similis	f		Undinula darwini	a	f
Pontella atlantica		1	Vettoria granulosa		3
Scolecithricella marginata		1	Calocalanus plumulosus	f	

REMARKS. These two surface tows were taken on successive nights at about the same time and only a mile apart. One yielded twenty-eight species and the other thirty species. Fourteen species (40%) were each confined to one of the tows and did not appear in the other, while twenty-two species (60%) were present in both tows.. This is a much more equable distribution than that of the tows taken between stations 60 and 61. It is worthy of note that altho one tow covered a distance five and a half times greater than the other there is very little difference in the volume, and that little is in favor of the shorter tow.

The second tow contains one of two records of Pontella atlantica in the eastern Pacific. Both tows were taken near midnight and in both five of the six species of Oncaea appear in varied abundance, while the sixth species was absent from the later tow.

do

S T A T I O N 62

(36 species)

34° 35' S. 91° 52' W. Dec. 30, 1928

Bottom depth 3610 m.

Depth of tow, m.	0	50	100	Depth of tow, m.	0	50	100
Temperature, C.	19.2	16.2	13.1	Density, σtP.	24.4	25.3	26.2
Salinity, o/oo	34.2	34.2	34.1	Hydrogen ion pH	8.12	8.10	8.06
Volume of tow, cm^3	36	36	36	Length of tow, miles	0.1	0.1	0.1
Acartia danae		f	f	Oithona brevicornis		r	
negligens			1	plumifera			2
Acrocalanus gracilis	1	f	r	similis		f	
Clausocalanus arcuicornis	f	a	c	Oithonina nana		2	
furcatus		a	a	Oncaea media	2	c	c
Clytemnestra scutellata		2		mediterranea		c	f
Corycaeus agilis		4		minuta	f		
catus		2	3	notopa		c	c
crassiusculus		5	r	similis		r	c
lautus		1	1	venusta		c	a
typicus		1		Paracalanus parvus	f	f	c
Farranula curta		a	a	pygmaeus		2	
rostrata		f		Pseudocalanus minutus	f	r	f
Mecynocera clausi		c	c	Sapphirina angusta		1	2
Microcalanus pygmaeus		3	4	Scolecithrix danae		a	c
Miracia efferata			1	Spinocalanus abyssalis		f	
Neocalanus gracilis		c	r	Calocalanus plumulosus		1	1
tenuicornis			1	Undinula darwini		a	c

REMARKS. The temperature ~~is~~ was moderate at the surface and ~~drops~~ fell six degrees in 100 meters; the salinity and hydrogen ion ~~are~~ were fairly high and about constant. Only six species were found at the surface, thirty-one in the 50-meter tow, and twenty-six in the 100-meter tow. Fourteen species (40%) were each confined to a single tow and five were present in all three tows. The volume and length of the three tows were exactly the same although the copepod species were so unequally distributed. Compare the fact that the genera Corycaeus, Farranula and Oncaea are here practically confined to the 50-and 100-meter tows with their abundant surface distribution in the two night tows which follow. Note also the lack of Aetideus, Megacalanus and Undeuchaeta in all three of these station tows and their presence at the surface in the night tows.

do

B E T W E E N S T A T I O N S 62 & 63

(50 species)

A. 32° 23' S. 89° 42' W. Dec. 31, 1928.
B. 32° 25' S. 89° 49' W. Dec. 31, 1928.

Surface only

Location of tow	A	B	Location of tow	A	B
Acartia danae	f	c	Megacalanus longicornis	4	
negligens	c	c	Microcalanus pusillus	4	3
Acrocalanus gibber	1		Neocalanus gracilis	f	
gracilis	r	f	robustior	2	
Candacia bispinosa		1	tenuicornis		1
norvegica	2		Oncaea curta		r
simplex		r	media	a	f
Clausocalanus arcuicornis	c	a	mediterranea	f	c
furcatus	f	a	minuta	a	a
Clytemnestra scutellata	1		notopa	a	r
Corycaeus agilis		2	similis	f	r
catus	3		tenella	f	
crassiusculus	f		venusta	a	a
lautus		1	Paracalanus parvus	c	a
pumilus	4	f	pygmaeus	c	
typicus	f		Pleuromamma gracilis	c	
Farranula carinata	c		Pontellina plumata	1	
concinna	c		Pseudocalanus minutus	c	a
curta	a	c	Scolecithrix danae	f	
gibbula	a		Calocalanus plumulosus	1	
gracilis	c		Undeuchaeta major	4	
rostrata	a	f	Undinula darwini	a	a
Lucicutia flavicornis	1		Vettoria granulosa	2	
Mecynocera clausi		c	Undinula caroli	f	
Aetideus bradyi	1		Undeuchaeta plumosa	f	

REMARKS.. These two surface tows were made the same night five or six miles apart. Together they yielded fifty species of which 43 were found in one tow and 25 in the other. Thirty-two species (64%) were taken in one tow only and did not appear in the other, while eighteen species (36%) were present in both tows.. Here again is a striking diversity in the surface distribution of the copepods within a comparatively short distance. And since these tows were nocturnal and some of the species at least had come to the surface from below it indicates that the diverse distribution was not confined to surface species alone. The three small genera, Corycaeus, Farranula and Oncaea ~~are~~ were especially well represented ~~in both species and numbers~~ and ~~They were so well represented~~ in the tow designated as A ~~that~~ they constituted more than 90% of its copepod plankton. Aetideus, Megacalanus and the two Undeuchaeta species were almost certainly migrants from below ~~and were among those confined to a single tow.~~ The time of the tows was not recorded but it is very probable that the one designated as A. was taken nearer midnight than the other-

Space

do

B E T W E E N S T A T I O N S 63 & 64

(50 species)

A. 32° 05' S. 88° 58' W. Jan. 1, 1929
B. 32° 03' S. 88° 55' W. Jan. 1, 1929
C. 32° 01' S. 88° 54' W. Jan. 2, 1929

Surface only

Location of tow Volume of tow,. cm^3 Time of tow	A 48 3-9 PM	B 48 9-12 PM	C 32 12-2 AM	Location of tow Length of tow, miles	A 0.1	B 0.6	C 0.1
Acartia danae	c	c	c	Microcalanus pusillus	c		a
negligens	f	f	c	pygmaeus	f	c	a
Acrocalanus gibber	c	f	2	Neocalanus gracilis		f	
gracilis	c	c	c	robustior	f	c	
Candacia bispinosa	3			Oncaea media	c	c	f
norvegica	4		2	mediterranea	f	r	r
simplex	f		3	minuta	a	a	a
Centropages calaninus	1			notopa	c	c	c
Clausocalanus arcuicornis	a	c	a	tenella	f	f	f
furcatus	c	f	c	venusta	a	a	a
Corycaeus agilis	1	r	f	Paracalanus aculeatus			f
catus	f	f	r	parvus	c	c	c
crassiusculus	f	f	2	pygmaeus	r		f
pumilus	f	a	f	Pleuromamma gracilis		a	f
Euchaeta acuta		f		Pontella tenuiremis		1	1
Euchirella brevis		1		Pseudocalanus minutus	f	f	a
Farranula carinata	f	f		Sapphirina angusta		1	
concinna		r		auronitens			2
curta	a	a	c	Scolecithricella bradyi	f	r	r
gibbula	r	r		Scolecithrix danae	f		f
gracilis	r			Calocalanus plumulosus	3		
rostrata	a	c	c	Undinula caroli	c	f	
Megacalanus longicornis	5			darwini	a	a	a
Undeuchaeta plumosa	3			Oncaea subtilis			3
Candacia aethiopica		1		Calanus propinquus juv.	3		

REMARKS.. These are the first three of a series of nine surface tows taken between the above stations on three successive nights. Two of the three here recorded were taken the first night and one the second night. These three tows totalled 50 species, thirty-nine in the first tow, thirty-five in the second tow, and thirty-three in the third tow. Sixteen species (32%) were each confined to one of the tows, while twenty-three species or almost half, were present in all three tows. Corycaeus, Farranula and Oncaea were again abundant at the surface in all three tows and Megacalanus and Undeuchaeta reappeared from below. But not a solitary specimen of any species of Oithona appeared. Candacia aethiopica is also more often found in the deeper tows than at the surface. Megacalanus and Undeuchaeta here appeared

B E T W E E N S T A T I O N S 63 & 64

(44 species)

do

A. 32° 00′ S. 88° 52′ W. Jan. 2, 1929
B. 31° 58′ S. 88° 50′ W. Jan. 2, 1929
C. 31° 50′ S. 88° 22′ W. Jan. 2, 1929

Surface only

Location of tow	A	B	C	Location of tow	A	B	C
Volume of tow, cm³	32	36	36	Length of tow, miles	0.1	0.1	0.2
Time of tow	2-4 AM	4-8 AM	10-12 PM				
Acartia danae	c			Neocalanus gracilis		r	
negligens	f	c	c	robustior			2
Acrocalanus gibber	f			Oithona brevicornis		1	
gracilis	a	r	r	Oncaea curta	c		
Candacia bispinosa	2			media	c	1	
norvegica	2			mediterranea	f		f
simplex		1		minuta	a	r	a
Clausocalanus arcuicornis	a	c	c	notopa	a		3
furcatus			f	similis	r		
Corycaeus agilis	f			subtilis	r		
catus	f			tenella	c		2
crassiusculus	r			venusta	c		f
pumilus	f		1	Paracalanus parvus	f	a	c
typicus	2			pygmaeus	a	f	r
Farranula curta	c		f	Pleuromamma gracilis			f
gibbula	1			Pseudocalanus minutus	a	a	c
rostrata	c	1	c	Sapphirina auronitens			1
Megacalanus longicornis			4	Scolecithricella bradyi	f		
Microcalanus pusillus		a		Undinula caroli		r	r
pygmaeus	a	f		darwini	a	a	a
Candacia longimana	2			Undeuchaeta major	5		
Euchaeta spinosa			1	Phaenna spinifera		2	

REMARKS. These are the second three nocturnal tows all taken on the same night. The three yielded 44 species, thirty-two species in A, seventeen species in B, and twenty-two species in C. Twenty-six species (60%) were each confined to a single tow, while nine species were present in all three tows. Here also we find Megacalanus and Undeuchaeta coming up from below, and Corycaeus and Oncaea abundant in tows A and C, but almost lacking in tow B, A single specimen of Oithona was found in tow B, but none in either of the other tows. Outside of the 1000 meter tow taken at the next station the tow here designated as C contained the only record for Euchaeta spinosa during the cruise.

B E T W E E N S T A T I O N S 63 & 64

(38 species) ?

do

A. 31° 54' S. 88° 18' W. Jan. 3, 1929
B. 31° 52' S. 88° 20' W. Jan. 3, 1929
C. 31° 51' S. 88° 21' W. Jan. 3, 1929

Surface only

Location of tow Volume of tow, cm³ Time of tow	A 36 1–7.30 AM	B 36 2–4 AM	C 36 12–2 AM	Location of tow Length of tow, miles	A 0.1	B 0.1	C 0.1
Acartia danae		c		Microcalanus pygmaeus			3
negligens		c	r	Neocalanus gracilis		1	2
Acrocalanus gibber		r		Oithona brevicornis			2
gracilis	a	c	c	Oncaea curta		r	
Candacia bispinosa		1		media		f	
norvegica		1	1	mediterranea		r	
simplex		1		minuta		a	c
Clausocalanus arcuicornis	a	a	c	notopa		f	f
furcatus	a	r	c	venusta		f	f
Corycaeus crassiusculus	1			Paracalanus parvus	a	c	a
typicus		2		pygmaeus		c	
Farranula carinata		r		Pleuromamma gracilis			f
curta		f	c	Pseudocalanus minutus	f	f	c
gracilis		3		Sapphirina angusta		1	
rostrata		c	c	auronitens		1	
Megaclanus longicornis	1		3	Undinula caroli		f	
Microcalanus pusillus	1			darwini	f	f	a
Candacia longimana		2		Calanus propinquus juv.			f
Euchaeta acuta			2				

REMARKS. These are the last 3 of the nocturnal tows and were all taken the same night between midnight and morning. The three tows total 37 species- nine species in tow A, twenty-nine species in tow B, and twenty species in tow C. Twenty-two species (60%) were each confined to one tow and did not appear in either of the other two, while six species were found in all three tows. Corycaeus is here reduced to a total of 3 specimens, while Farranula and Oncaea are entirely absent from tow A. which was the latest of the three in the early morning. Megacalanus was present in two of the tows, the earliest and the latest, but Undeuchaeta did not appear in any of them. Candacia, Farranula and Oncaea were practically restricted to the tow designated as B, which came after midnight from 2 to 4 A.M.

20

S T A T I O N 64

(71 species)

31° 54′ S. 88° 17′ W. Jan.. 3, 1929

Bottom depth 3879 m..

Depth of tow,m.	1000	Depth of tow,m.	1000
Temperature,. C..	3.8	Density,. σtP.	32.0
Salinity,. o/oo	34.3	Hydrogen ion pH	7.76
Volume of tow, cm^3	64	Length of tow,miles	0.1
Acartia danae	f	Lophothrix frontalis	1
negligens	r	humilifrons	1
Acrocalanus gracilis	c	Mecynocera clausi	c
Centropages calaninus	1	Megacalanus longicornis	1
Chiridiella sp.. (immature)	3	princeps	2
Chiridius poppei	1	Metridia longa	4
Clausocalanus arcuicornis	c	lucens	2
Corycaeus flaccus	2	princeps	3
lautus	1	Onchocalanus triqoniceps	1
longistylis	3	Neocalanus gracilis	2
Eucalanus crassus	1	robustior	1
elongatus	3	Oithona similis	r
mucronatus	2	spinirostris	2
Euchaeta acuta	2	Oncaea conifera	c
spinosa	f	curta	f
Euchirella intermedia	3	media	1
messinensis	1	mediterranea	r
rostrata	1♂	notopa	r
Gaetanus armiger	4	similis	f
kruppi (immature)	1♂	tenella	3
miles	1	venusta	c
minor	3	Pareuchaeta incisa	4
Gaidius affinis	1	Phaenna spinifera	1
tenuispinus	3	Phyllopus helgae	3
Haloptilus actifrons	1	Pleuromamma abdominalis	2
longicornis	1	gracilis	a
plumosus	1	robusta	3
Heterorhabdus abyssalis	3	xiphias	5
compactus	1	Pseudochirella divaricata	1
papillager	1	Scolecithricella auropecten	5
Heterostylites longicornis	1♂	Scolecithrix bradyi	2
Lucicutia clausi	3	danae	2
flavicornis	1	Undeuchaeta major	3
longicornis	4	plumosa	3
Scolecithricella valida	2	Undinula darwini	f
Onchocalanus cristatus	1	Valdiviella minor	1
		Amallophora typica	2

REMARKS. This is the only instance during the entire cruise when a towing was made below 100 meters. Here the net was lowered to 1000 meters and drawn horizontally for a tenth of a mile and then raised to the surface. Since the net employed could not be closed, we have in it a combination of a horizontal tow at a depth of 1000 m. and a vertical tow from 1000 meters to

B E T W E E N S T A T I O N S 64 & 65

do

A. 31° 52' S. 87° 42' W. Jan. 4, 1929 (44 species)
B. 31° 31' S. 86° 57' W. Jan. 4, 1929

Surface only

Location of tow Volume of tow, cm^3 Time of tow A 2–4 AM	A 32	B 36	Location of tow Length of tow, miles Time of tow B 6.45–10 PM	A 1.6	B 2.0
Acartia danae	c	c	Megacalanus longicornis	3	
negligens	c		Neocalanus gracilis	f	3
Acrocalanus gracilis	f	r	robustior	2	
Candacia norvegica	4	4	Oithona similis	1	
Centropages calaninus	2		Oncaea curta	f	
Chiridiella magna n.sp.	4		media	c	r
Clausocalanus arcuicornis	a	f	mediterranea	c	r
furcatus	c	f	minuta	a	
Clytemnestra rostrata	1		notopa	a	
Corycaeus agilis	3	1	similis	r	
catus	1		tenella	a	
clausi	2		venusta	a	a
crassiusculus	f		Paracalanus parvus	c	c
flaccus	3		pygmaeus	f	
pumilus	r		Pleuromamma gracilis	f	4
speciosus	f		Pseudocalanus minutus	c	r
typicus	f		Sapphirina auronitens	1	
Farranula carinata	c		pyrosomatis		1
curta	a	f	salpae	1	
gibbula	r		Scolecithricella bradyi	2	
rostrata	a		Calocalanus plumulosus		1
Mecynocera clausi	1		Undinula darwini	a	a

REMARKS. Two surface tows taken the same night at a considerable distance apart, one before and the other after midnight. Of the total of 44 species the tow after midnight contained all but two species, while the other tow contained only seventeen species. 29 species (66%) were confined to one tow and did not appear in the other while fifteen species were found in both tows. The great difference in the number of species in the two tows is good evidence that the downward migration begins at or shortly after midnight. Megacalanus ~~is~~ was confined to the tow shortly after midnight, and had not reached the surface at 10 P.M.

do

S T A T I O N 65

(42 species)

31° 07' S. 86° 39' W. Jan. 5, 1929

Bottom depth 3626 m.

Depth of tow, m.	0	50	100	Depth of tow,m.	0	50	100
Temperature,C.	20.2	16.5	14.8	Density, σ_t.	24.3	25.4	25.9
Salinity, o/oo	34.5	34.4	34.2	Hydrogen ion pH	8.10	8.10	8.10
Volume of tow, cm^3	96	32	48	Length of tow,miles	0.9	0.5	0.5
Acartia danae	2	c	c	Microcalanus pygmaeus		1	
negligens	3	c	f	Microsetella rosea			f
Acrocalanus gibber	3	4		Neocalanus gracilis			f
gracilis	c	c	f	robustior			2
Calanus minor		f	f	tenuicornis			f
Candacia simplex		1		Oithona attenuata			2
Clausocalanus arcuicornis	a	a	c	fallax			a
Corycaeus agilis	f			setiger			f
dubius	r			similis	f	c	a
flaccus	r			spinirostris			c
pacificus			3	Oncaea minuta		a	a
pumilus			2	venusta	1	a	a
typicus		f		Paracalanus parvus	4	c	f
Farranula carinata			c	pygmaeus		f	
gibbula	f			Pleuromamma abdominalis			1
rostrata		f	c	gracilis			1
Heterorhabdus papillager			4	Pseudocalanus minutus	f	c	c
Lucicutia clausi			1	Sapphirina salpae			5
flavicornis		1	f	Scolecithrix danae		f	f
Mecynocera clausi		c	a	Calocalanus plumulosus		2	
Metridia lucens		4		Undinula darwini			c

REMARKS. The temperature was moderate at the surface and dropped five and a half degrees in 100 meters; the salinity and hydrogen ion were fairly high and constant. Thirteen species were taken at the surface, twenty-one in the 50-meter and thirty-one in the 100-meter tow. Twenty seven species (64%) were each confined to a single tow and eight were present in all three tows. Corycaeus, Farranula, and Oithona were well represented in species, and although there were only two species of Oncaea they were both abundant in the two deeper tows. The four specimens of Metridia lucens in the 50-meter tow was the largest number of the species taken at any station in the eastern Pacific. Mecynocera, which was represented by a single specimen in the four preceding surface tows, is here common in the 50-meter tow and abundant in the 100-meter tow. Heterorhabdus, the three Neocalanus species and Pleuromamma appear only in the 100-meter tow.

space

The surface tow was virtually an exclusive colony of Clausocalanus, the other species, when combined, falling below 10%. The two Oncaea species were especially abundant in the 50-meter tow and the Oithona species in the deepest tow.

do

S T A T I O N 67

24° 57′ S., 82° 15′ W. Jan. 8, 1929 (45 species)

Bottom depth 1089 m.

Depth of tow,m.	0	50	100	Depth of tow,m.	0	50	100
Temperature,C.	19.2	17.3	16.2	Density, σtP.	24.9	25.4	25.8
Salinity,.o/oo	34.9	34.7	34.6	Hydrogen ion pH	8.11	8.11	8.08
Volume of tow, cm^3	32	32	32	Length of tow, miles	0.3	0.3	0.3
Acartia danae	a	a		Miracia efferata			1
negligens	c	f	c	Neocalanus gracilis			c
Acrocalanus gibber		2	f	robustior		2	4
gracilis	c	c	f	tenuicornis			f
Candacia truncata			2	Oithona attenuata		3	f
Clausocalanus arcuicornis	f	f	c	fallax	2		c
furcatus	4			setigera			3
Clytemnestra rostrata			4	similis		f	c
scutellata			3	spinirostris		5	f
Corycaeus agilis	f			Oncaea curta	2		
crassiusculus		2		minuta	3	f	
ovalis	2			venusta	2	c	a
longistylis			4	Paracalanus parvus	f	f	f
pacificus			2	Phaenna spinifera			1
typicus		2	f	Pleuromamma gracilis			f
Farranula carinata	2	c	f	Pontellina plumata			1
gibbula	r			Pseudocalanus minutus		f	f
rostrata		f	c	Sapphirina auronitens			2
Haloptilus longicornis			1	nigromaculata			1
Lucicutia flavicornis		2	f	Scolecithrix danae		1	
Mecynocera clausi		2	c	Undinula darwini		3	c
Microsetella rosea			2	Sapphirina metallina			1
Microcalanus pusillus		1					

REMARKS.. The temperature was moderate at the surface and fell three degrees in the 100 meters; the salinity and hydrogen ion remaining constant.. Fourteen species were present at the surface, twenty-two in the 50-meter tow and thirty-five in the 100-meter tow. Twenty-five species (55%) were each confined to a single tow while six species were found in all three tows. Corycaeus and Oithona presented many species, but comparatively few specimens, and this paucity in numbers was shared by nearly all the other genera since only two of them were recorded as abundant. Microsetella was here found only in the 100-meter tow although it is usually a surface form.

do

S T A T I O N 69

16° 49′ S. 78° 39′ W. Jan. 12, 1929 (54 species)

Bottom depth 3657 m.

Depth of tow,m.	0	50	100	Depth of tow,m	0	50	100
Temperature,C.	21.1	17.3	14.5	Density, σtP.	24.6	25.7	26.4
Salinity, o/oo	35.2	35.1	34.8	Hydrogen ion pH	8.12	7.99	7.86
Volume of tow, cm³	48	32	64	Length of tow,miles	1.0	0.9	0.9
Acartia danae	c	f	c	Lucicutia clausi		1	1
negligens	c			flavicornis			2
Acrocalanus gracilis		4	2	Macrosetella gracilis			f
monachus		2		Mecynocera clausi		4	f
Aetideus armatus			1	Metridia brevicauda			2
Calanus propinquus	2	f	f	lucens			2
Candacia simplex	1			Microsetella norvegica		2	
Canthocalanus pauper		2		rosea		f	c
Clausocalanus arcuicornis			f	Neocalanus gracilis			f
Clytemnestra rostrata			2	Oithona attenuata		f	ff
Corycaeus crassiusculus		f	a	plumifera	4	c	c
pumilus			r	similis	a	f	a
speciosus			1	spinirostris		2	
typicus			r	Oithonina nana		2	f
Eucalanus attenuatus		a	c	Oncaea media	f		
crassus		f	f	minuta	c	f	a
elongatus	c	c	c	venusta	c	a	a
Euchaeta marina	f	4	r	Paracalanus parvus	c	c	f
Euchirella brevis		2		pygmaeus		2	
pulchra		1		Pseudocalanus minutus	f		
Farranula carinata	4			Sapphirina angusta			1
gibbula	f			auronitens	1	1	1
rostrata		2		nigromaculata		1	2
Haloptilus longicornis			f	Calocalanus plumulosus			3
Heterorhabdus papillager		1		Undinula darwini	f		
spinifrons			1	Pleuromamma gracilis		2	
Phaenna spinifera	1			Scolecithricella minor			1

REMARKS.. The surface temperature was higher but it fell nearly seven degrees in the 100 meters ; the salinity and hydrogen ion were high at the surface but diminished a little in the two lower depths. Eighteen species were present at the surface, thirty in the 50-meter tow and thirty-six in the 100-meter tow. Thirty-four species (63%) were each confined to a single tow and ten were present in all three tows. Three species alone were recorded as abundant and nearly half of the records were numerals, fifteen of them each a single specimen. Aetideus, Haloptilus and Metridia were found only in the 100-meter tow , and the same was true of all but one of the Corycaeus species. On the other hand each of the Oncaea species was present at the surface, but two of them were more abundant in the deeper tows.

S T A T I O N 70

(42 species)

13° 35′ S. 77° 54′ W. Jan. 13, 1929

Bottom depth 4742 m.

Depth of tow,m.	0	50	100	Depth of tow,m.	0	50	100
Temperature,C.	21.2	15.4	12.5	Density, σtP..	24.5	25.8	26.3
Salinity, o/oo	35.0	34.9	34.7	Hydrogen ion pH	8.05	7.88	7.68
Volume of tow, cm^3	64	32	128	Length of tow,miles	1.0	1.2	1.2
Acartia danae		f	f	Microsetella norvegica		2	
Acrocalanus gracilis		2	r	rosea		f	f
Aetideus armatus		2	3	Neocalanus gracilis			2
Calanus propinquus	a	a	a	Oithona attenuata			2
Candacia norvegica			1	plumifera		2	5
pachydactyla			1	similis	2		
Clytemnestra rostrata			3	Oithonina nana	1		
scutellata			1	Oncaea curta			r
Corycaeus crassiusculus	a	c	c	media	f		
plumilus	r			minuta	5	f	f
robustus			r	similis		f	2
speciosus			2	venusta	c	a	a
Eucalanus attenuatus	2	c	a	Paracalanus parvus	c	a	
crassus	1	c	a	Pseudocalanus minutus	1	f	3
elongatus			a	Sapphirina angusta		1	
Euchaeta marina	f	f	f	auronitens		1	
Euchirella intermedia			1	nigromaculata		1	
Haloptilus longicornis			2	opalina		1	3
oxycephalus			1	Scolecithricella minor			1
Macrosetella gracilis			3	Calocalanus plumulosus			1
Mecynocera clausi			2	Canthocalanus pauper		1	

REMARKS. The surface temperature was again high but dropped almost nine degrees (41%) in the 100 meters; the salinity was high and constant, the hydrogen ion diminished in the two deeper tows. Thirteen species were recorded at the surface, twenty-one in the 50-meter tow and thirty-two in the 100-meter tow. Twenty-six species (62%) were each restricted to a single tow and eight were present in all three tows. The Eucalanus species were especially abundant in the 100-meter tow, and Calanus in all three tows, more especially at the surface. Numerals were again very much in evidence in the records, and fifteen of them were single specimens. Two species of Corycaeus were present at the surface, one of them in abundance, but the other two species were found only in the deepest tow. Oncaea was well divided among the three tows. The four Sapphirina species each comprised a single specimen taken in the 50 meter tow.

do

S T A T I O N 71

(40 species)

11° 57′ S. 78° 37′ W. Feb. 6, 1929

Bottom depth 3357 m.

Depth of tow,m.	0	50	100
Temperature,C.	23.4	16.7	13.9
Salinity, o/oo	35.2	35.1	35.0
Volume of tow, cm^3	160	32	32
Acartia danae	c	c	f
Calanus minor		f	r
propinquus	f	5	2
Candacia simplex		1	
Clausocalanus arcuicornis			f
Clytemnestra rostrata			3
scutellata			1
Copilia denticulata		1	
quadrata			2
Corycaeus crassiusculus	f	f	a
longistylis			1
pacificus			r
pumilus			f
speciosus	f		
Eucalanus attenuatus	c	a	a
crassus	c	c	a
elongatus	c	c	a
monachus			c
Euchaeta marina	f	c	f
Haloptilus spiniceps		1	

Depth of tow,m.	0	50	100
Density,. σtP.	24.0	25.9	26.6
Hydrogen ion pH	8.13	7.90	7.72
Length of tow, miles	1.3	1.6	1.6
Heterorhabdus papillager	1		
Labidocera detruncata	3		
Macrosetella gracilis		f	1
oculata		1	
Mecynocera clausi		f	f
Microsetella rosea	f	f	r
Oithona attenuata	f	f	
plumifera	c	c	c
similis	a	a	a
Oncaea media		f	
minuta	c	c	a
venusta	a	a	a
Paracalanus parvus	c	f	c
Pleuromamma gracilis			4
Pseudocalanus minutus	f		f
Sapphirina angusta	3		2
auronitens	2		
scarlata		1	1
Scolecithricella bradyi			1
Calocalanus plumulosus	1	f	5

REMARKS. The temperature was again high at the surface but fell nine and a half degrees in the 100 meters ; the salinity remained high at all three depths, the hydrogen ion diminished a little. Twenty-one species were present at the surface, twenty-four in the 50-meter tow and thirty in the 100-meter tow. Nineteen species (47%) were each confined to a single tow and fourteen species were found in all three tows. Three Eucalanus species, Oithona similis and two Oncaea species were abundant or common in all three tows, and the percentage of numerals in the records were considerably reduced. Only a single specimen of Heterorhabdus was captured and that was in the surface tow contrary to the usual distribution.

20

S T A T I O N 74

(52 species)

11° 00′ S.. 87° 24′ W. Feb. 12, 1929

Bottom depth 4141 m.

Depth of tow,m.	0	50	100	Depth of tow,m.	0	50	100
Temperature,C.	24.2	19.2	15.4	Density, σtP.	24.0	25.5	26.4
Salinity, o/oo	35.6	35.3	35.0	Hydrogen ion pH	8.17	8.06	7.88
Volume of tow, cm³	64	32	96	Length of tow,miles	1.2	1.4	1.4
Acartia danae		f		Haloptilus longicornis			f
Calanus minor	f	f	c	oxycephalus			1
propinquus		3	c	Labidocera detruncata	f		
Calocalanus pavo		1		Lubbockia squillimana			4
styliremis		5	f	Lucicutia flavicornis			2
Candacia simplex	1			Mecynocera clausi		f	f
Centropages calaninus	5			Microsetella rosea			f
Clytemnestra rostrata			1	Oithona attenuata		f	f
scutellata			2	plumifera		5	
Copilia quadrata			1	similis	f	f	a
vitrea		1		Oncaea minuta	c	f	a
Corycaeus crassiusculus	a	2	f	venusta	c	f	a
giesbrechti	r			Paracalanus parvus	c	f	f
longistylis		f		Pleuromamma gracilis			c
pumilus		r		Pseudocalanus minutus	a		c
ovalis	2			Rhincalanus cornutus		1	3
speciosus	1		5	Sapphirina angusta	1		5
Eucalanus attenuatus		a	a	auronitens	1		
crassus		a	f	nigromaculata			3
elongatus		a	f	Temora discaudata	2		2
monachus	1			Calocalanus plumulosus			r
Euchaeta marina	r	f	f	Undinula vulgaris	1	2	5
Danodes plumata n.sp..	5			Lucicutia clausi		f	
Euchirella brevis			3	Phaenna spinifera	3		
Heterorhabdus papillager		2		Pachosina piona		5	
Lucicutia curta			2	Oithona spinirostris	2		

REMARKS.. The temperature, salinity and hydrogen ion were all high at the surface, the former fell nine degrees in the 100 meters and the two latter diminished a little. Twenty-two species were taken at the surface, twenty-five in the 50-meter tow and thirty-three in the 100-meter tow. Thirty-two species (61%) were restricted to a single tow and eight species were found in all three tows. The Eucalanus species ~~are~~ were again conspicuous in the two deeper tows, but only a single specimen was found at the surface.. Five specimens of the new genus Pachosina were taken in the 50 meter tow, and five of the new genus Danodes at the surface. The Corycaeus and Oncaea species were well distributed in all three tows. Haloptilus,. Lubbockia and Lucicutia ~~are~~ were all restricted to the 100-meter tow and this contains the only record of Lucicutia curta for the entire cruise.

do

S T A T I O N 75

14° 15′ S. 92° 05′ W. Feb. 14,. 1929 (56 species)

Bottom depth 3480 m.

Depth of tow,m..	0	50	100	Depth of tow,m.	0	50	100
Temperature,c.	22.7	20.0	17.8	Density„ ϭtP..	24.6	25.4	26.1
Salinity,. o/oo	35.8	35.5	35.4	Hydrogen ion pH	8.18	8.14	8.06
Volume of tow, cm^3	48	32	48	Length of tow,. miles	0.4	1..7	1..7
Acartia danae	2	f	f	Mecynocera clausi		c	c
Calanus minor		f		Microsetella norvegica			2
propinquus		f	f	rosea		f	f
Calocalanus pavo		2	3	Neocalanus gracilis		1	
styliremis		f		Oithona attenuata			f
Candacia bipinnata			2	plumifera		5	f
simplex		2	4	similis		c	c
Clytemnestra rostrata			1	spinirostris			2
scutellata		1		Oncaea media	f		
Corycaeus crassiusculus	f	f		minuta		f	c
longistylis		1	1	venusta	f	c	a
pacificus		r		Paracalanus parvus	c	c	
pumilus	r			pygmaeus			2
Eucalanus attenuatus		a	a	Pleuromamma gracilis			f
crassus		f	f	Pontella securifer	6		
elongatus		a	c	lobiancoi	c		
monachus		r	f	Pseudocalanus minutus	c	c	f
Euchaeta marina		1	2	Rhincalanus cornutus			1
Farranula carinata		1		Sapphirina auronitens	1		
rostrata			2	nigromaculata		f	f
Haloptilus longicornis		1	f	opalina		1	4
ornatus			2	Temora discaudata		a	a
plumosus			2	Calocalanus plumulosus		c	
Heterorhabdus papillager			1	Undinula vulgaris		2	5
Lubbockia squillimana			f	Phaenna spinifera	2		
Lucicutia clausi			f	Pachosina piona	5		
flavicornis			f	Neocalanus tenuicornis			3
Euchirella brevis		2		Undinula darwini		2	

REMARKS.. Again the temperature, salinity and hydrogen ion were high at the surface, the temperature decreased five degrees and the other two diminished only slightly in the 100 meters.. Twelve species were found at the surface, thirty-three in the 50 meter tow and thirty-eight in the 100 meter tow. Thirty-one species (55%) were each confined to a single tow and only three species were present in all three tows. Five specimens of the new genus Pachosina were here taken at the surface and none in the deeper tows. The four species of Eucalanus were again found in both the deeper tows but none at the surface. Corycaeus and Oncaea are distributed in all three tows with the latter genus decidedly more abundant in the two deeper tows-

do

S T A T I O N 78

(41 species)

13° 02′ S.. 108° 03′ W. Feb.. 20,, 1929

Bottom depth 3337 m..

Depth of tow,m..	50	100	Depth of tow,m.	50	100
Temperature,C..	23.8	21.9	Density, σtP..	24.7	25.5
Salinity,, o/oo	36.0	36.1	Hydrogen ion pH	8.14	8.14
Volume of tow,, cm³	80	32	Length of tow,miles	0.4	0.4
Acartia danae	c	f	Microsetella rosea	c	c
Acrocalanus gracilis		f	Neocalanus gracilis		f
Calanus minor	f		Oithona attenuata	a	a
Calocalanus pavo		1	plumifera	f	c
Candacia simplex	c		similis	a	
Clausocalanus arcuicornis		f	spinirostris		f
Corycaeus crassiusculus	a	c	Oncaea minuta	a	c
flaccus		f	venusta	a	
minimus	r		Paracalanus parvus		c
speciosus		2	pygmaeus	c	
Farranula carinata	a	f	Pseudocalanus minutus		f
gibbula	2		Pontellina plumata	2	
rostrata	a	f	Rhincalanus cornutus	a	a
Haloptilus longicornis	4	f	Sapphirina auronitens	3	4
Lucicutia flavicornis	2	3	nigromaculata		2
longicornis		2	Temora discaudata		f
Mecynocera clausi	a	a	Calocalanus plumulosus	2	
Scolecithricella propinqua	1		Microcalanus pygmaeus	3	
Centropages calaninus		2	Neocalanus robustior		2
Euchirella messinensis	1		Temora longicornis	1	
Heterorhabdus papillager		1			

REMARKS. The surface tow is lacking, the other two showed high temperatures, salinity and hydrogen ion, with little variation. Twenty-six species were taken in the 50-meter tow and twenty-eight in the 100-meter tow. Twenty-eight species (70%) were found in one tow and not in the other, while ten were present in both tows. The 50 meter tow contains one of the two Pacific records for two species, Corycaeus minimus and Temora longicornis, and also has two other rare species Scolecithricella propinqua and Euchirella messinensis. Of the four genera rated as very abundant at the surface in the record of Station 77 only two appear here as abundant in the 50-meter tow. Conversely Rhincalanus, of which there was but a single specimen there at the surface, is here abundant in both the deeper tows. Farranula, Oncaea, and Mecynocera are also especially abundant in the 50 meter tow, and Oithona in the 100-meter tow.

do

S T A T I O N 80

(54 species)

12° 39′ S. 117° 22′ W. Feb. 24, 1929

Bottom depth 3515 m.

Depth of tow,m.	0	50	Depth of tow,m	0	50
Temperature,C.	26.0	25.9	Density, σ_t.	23.7	24.0
Salinity, o/oo	35.9	35.9	Hydrogen ion pH	8.20	8.19
Volume of tow, cm³	64	96	Length of tow,miles	0.4	1.0
Acartia danae	f	f	Farranula carinata	c	c
Acrocalanus gracilis	c		rostrata	a	c
monachus	f	f	Haloptilus acutifrons		1
Calanus minor	c	f	Labidocera detruncata	a	f
Calocalanus pavo		2	Lubbockia squillimana		f
Candacia aethiopica	f		Lucicutia clausi	2	
bispinosa		c	Mecynocera clausi		c
norvegica	2	5	Microsetella rosea	f	a
simplex	a	a	Oithona attenuata		f
truncata		f	plumifera		f
Clausocalanus arcuicornis	c	c	similis	c	f
Clytemnestra rostrata		1	Oncaea curta		2
scutellata		4	media		f
Corycaeus agilis	f		minuta	a	c
catus		2	venusta	a	c
crassiusculus	a	a	Paracalanus parvus	a	c
longistylis	c	c	pygmaeus	f	
speciosus	f	f	Pseudocalanus minutus	a	c
typicus		1	Rhincalanus cornutus		a
Eucalanus attenuatus		c	Sapphirina auronitens	4	
crassus		4	nigromaculata	2	
elongatus		c	Scolecithrix danae		2
Euchaeta acuta	1		Temora discaudata	f	
marina		5	stylifera	4	4
Euchirella curticauda		2	Undinula caroli	f	f
pulchra		1	darwini	f	
Centropages calaninus	4		Microcalanus pusillus		3

REMARKS. We have here high temperature, salinity and hydrogen ion in both tows, with practically no variation. Thirty-one species were taken at the surface and forty-three in the 50-meter tow. Thirty-four species (63%) were present in one tow but wholly absent from the other and twenty species were taken in both tows. The three Eucalanus species, the two Euchirella species and Rhincalanus did not appear at the surface while the Candacia, Corycaeus, Farranula and Oncaea species were about equally divided between the two tows. The 50-meter tow was two and a half times the length of the surface tow and its volume was one and a half times as great. Eucalanus, Euchirella, Haloptilus and Rhincalanus appeared only in the deeper tow while ~~Corycaeus~~ Labidocera and ~~Oncaea~~ Undinula were well divided between the two tows.

do

S T A T I O N 82

(52 species)

14° 52′ S. 126° 07′ W. Feb. 28, 1929

Bottom depth 3631 m..

Depth of tow, m	0	50	Depth of tow, m	0	50
Temperature, C.	27.2	27.2	Density, σtP.	23.6	24.0
Salinity, o/oo	36.3	36.3	Hydrogen ion pH	8.21	8.21
Volume of tow, cm^3	32	64	Length of tow, miles	0.4	1.8
Acartia danae	r	f	Labidocera detruncata	f	
Acrocalanus gracilis	f	f	Lubbockia squillimana		f
monachus		5	Lucicutia flavicornis	1	2
Calanus minor		c	Mecynocera clausi		f
Calocalanus pavo		f	Megacalanus longicornis		c
styliremis		r	Microcalanus pusillus		1
Candacia bispinosa		f	pygmaeus		f
norvegica	1	f	Microsetella rosea	r	c
simplex		a	Neocalanus robustior		f
truncata		f	Oithona attenuata	r	f
Centropages calaninus		2	plumifera	2	4
Copilia quadrata	1		similis	f	f
Corycaeus crassiusculus	f	c	Oncaea conifera		2
longistylis	c	c	minuta	f	c
speciosus	c	c	venusta	f	a
typicus		f	Paracalanus parvus	f	c
Eucalanus attenuatus		c	Pontellina plumata		5
crassus		f	Pseudocalanus minutus		c
Euchaeta acuta		1	Rhincalanus cornutus		f
marina		f	nasutus		f
Euchirella pulchra		2	Sapphirina auronitens		1
Farranula carinata	a	c	metallina		1
curta		f	Scolecithrix danae		a
gibbula	c		Temora discaudata		3
rostrata	a	c	Undinula darwini		f
Pachos punctatum		2	Undeuchaeta plumosa	1	

REMARKS. Again the temperature, salinity and hydrogen ion were high and did not change. Twenty species were found in the surface tow and forty-eight species in the 50-meter net.. Thirty-six species (70%) were present in one tow and not in the other and sixteen species were found in both tows. The 50 meter tow was four and a half times as long as the surface tow but had only twice the volume. The same genera as at Station 81 together with many others were confined to the deeper tow, and the same genera were divided between the two tows. Only a single specimen of Candacia was present at the surface, all the others of the four species of this ~~two~~ genus appearing only in the 50-meter tow. Contrary to expectation the single specimen of Undeuchaeta was found at the surface rather than in the deeper tow.

do

S T A T I O N 88

(53 species)

16° 42'' S. 150° 41' W.. March 21,. 1929

Bottom depth 3697 m..

Depth of tow,m.	0	50	Depth of tow,m.	0	50
Temperature,C.	28.4	28.4	Density,. σ_tP..	22.9	23.2
Salinity,. o/oo	35.8	35.8	Hydrogen ion pH	8.23	8.25
Volume of tow,. cm^3	34	96	Length of tow,miles	0.4	0.3
Acartia danae		c	Farranula carinata	a	f
Acrocalanus gracilis	f	f	gibbula	r	
monachus		f	rostrata	c	
Calanus minor		fl	Lubbockia squillimana		4
Calocalanus pavo		2	Mecynocera clausi		1
Candacia bispinosa		f	Microcalanus pusillus		fl
norvegica		fl	pygmaeus		c
simplex	1	c	Microsetella rosea		f
truncata		4	Oithona attenuata		f
Centropages calaninus		c	plumifera		f
Clausocalanus arcuicornis		c	similis	2	f
Clytemnestra rostrata		1	Oncaea curta	3	
Copilia denticulata		fl	minuta	r	f
quadrata		2	similis		4
Corycaeus agilis	r		venusta		c
crassiusculus	r	a	Paracalanus parvus	c	a
flaccus	1		Pontellina plumata		1
longistylis		f	Pseudocalanus minutus		c
pumilus		rr	Sapphirina auronitens	2	1
speciosus		c	nigromaculata		2
typicus		2	opalina		3
Euchaeta acuta		3	Scolecithrix danae		a
marina		c	Undinula darwini		1
Acrocalanus longicornis	1		vulgaris		4
Calocalanus styliremis		2	Oncaea mediterranea		2
Scolecithricella propinqua	1		Pachos punctatum	3	
			Undeuchaeta minor	1	

REMARKS:. The temperature, salinity and hydrogen ion were high and the two former were exactly and the latter practically the same at both depths. Seventeen species were found at the surface and forty-four in the 50-meter tow. Forty-five species (85%) were present in one tow but not in the other;: eight species were found in both tows. Corycaeus and Oithona were much more abundant in the deeper tow while Farranula was more abundant at the surface , and constituted a large percentage of the surface tow. Although the 50-meter tow was a little shorter than the surface tow its volume was nearly three times as large.

S T A T I O N 89

(49 species)

17° 09' S. 152° 41' W. March 23, 1929

Bottom depth 4286 m.

Depth of tow, m.	0	50	Depth of tow, m	0	50
Temperature C..	28.3	28.3	Density, σ_t	22.7	23.1
Salinity, o/oo	35.6	35.8	Hydrogen ion pH	8.25	8.27
Volume of tow, cm^3	34	64	Length of tow, miles	0.3	0.5
Acartia danae		f	Farranula rostrata	f	f
Acrocalanus gracilis	a	f	Lubbockia squillimana		f
monachus		f	Macrosetella gracilis	f	1
Calanus minor		f	Microcalanus pusillus		f
Calocalanus pavo		1	Microsetella rosea	1	c
Candacia bispinosa		2	Neocalanus gracilis		4
simplex	2	a	robustior		2
truncata		f	Oithona attenuata		f
Centropages calaninus	2	f	plumifera		c
Clausocalanus arcuicornis	f	f	similis	a	c
Clytemnestra scutellata		4	Oithonina nana	c	
Copilia denticulata		c	Oncaea curta	r	
quadrata		2	media	f	f
vitrea		1	minuta	c	f
Corycaeus crassiusculus	c	2	venusta	f	c
dubius	r		Paracalanus parvus		c
typicus	2		Pontellina plumata		2
Euchaeta acuta		f	Sapphirina auronitens	1	
marina	2	a	opalina		2
Euchirella curticauda		1	Scolecithrix danae	1	a
Farranula carinata	a	f	Spinocalanus magnus		1
gibbula	r		Undinula vulgaris		f
Euchirella brevis		1	Pachosina piona.n.sp..	2	
Labidocera detruncata	2		Spinocalanus abyssalis		3
Oithona spinirostris		3			

REMARKS.. The temperature was high and exactly the same at both depths, the salinity and hydrogen ion increased slightly at the lower depths. Twenty-three species were found at the surface and forty-one in the 50-meter tow. Thirty-four species (70%) were found in one tow and not in the other, while fifteen species were common to both tows.

Corycaeus, Farranula and Oncaea were more abundant at the surface, but three of the four Oithona species did not appear at all in the surface tow. The two Euchaeta species were recorded as constituting 75% of the 50-meter tow.

do

B E T W E E N S T A T I O N S 89 & 90

(46 species)

17° 04' S.. 152° 58' W.. March 23,, 1929

Surface only

Volume of tow cm³ Time of tow 7.50-10PM	48	Length of tow, miles	0..1
Acartia danae	c	Farranula gibbula	f
Acrocalanus gracilis	c	gracilis	r
monachus	f	rostrata	c
Calanus minor	f	Labidocera detruncata	f
Calocalanus pavo	1	Lucicutia clausi	1
Candacia aethiopica	3	Macrosetella gracilis	a
bispinosa	f	oculata	2
norvegica	f	Microcalanus pygmaeus	c
simplex	c	Microsetella norvegica	1
Centropages calaninus	c	rosea	f
Clytemnestra rostrata	5	Neocalanus robustior	f
Corycaeus catus	r	Oncaea curta	2
crassiusculus	a	media	f
furcifer	r	minuta	a
longistylis	3	venusta	a
pacificus	4	Paracalanus parvus	c
pumilus	1	Pontella securifer	1
speciosus	f	Pontellina plumata	f
Euchaeta acuta	2	Sapphirina auronitens	f
marina	c	Spinocalanus magnus	2
Euchirella brevis	1	Calocalanus plumulosus	1
Farranula carinata	a	Undinula vulgaris	f
Acartia negligens	3	Canthocalanus pauper	2

REMARKS. This nocturnal tow yielded forty-six species, about as many as were obtained in both tows at each of the stations 89 and 90. Eighteen species which were confined to the 50-meter tow at stations 89 and 90,. one or both, were here found at the surface. In addition twelve species were here present at the surface in the night time, which did not appear in either of the two day-time tows at Stations 89 and 90. Thirty of the species, therefore, out of the forty-six give good evidence of nocturnal migration. Corycaeus, Farranula and Oncaea were especially abundant in this tow.

do

STATION 95

(74 species)

8° 43' S. 170° 56' W. April 24, 1929

Bottom depth 4298 m.

Depth of tow,m	50	100	Depth of tow,m.	50	100
Temperature,C.	29.3	28.5	Density, σ_tP.	22.1	23.1
Salinity, o/oo	34.9	35.4	Hydrogen ion pH	8.24	8.22
Volume of tow, cm^3	48	80	Length of tow,miles	1.9	2.2
Acrocalanus gibber	2	4	Farranula rostrata	f	f
gracilis	c	c	Haloptilus longicornis		a
longicornis	1	f	Lubbockia aculeata		3
monachus	a	c	attenuata, n.sp.		2
Scolecithricella propinqua		3	squillimana		f
Calanus minor	f	c	Lucicutia clausi		f
Calocalanus pavo	1		flavicornis		c
Candacia aethiopica	4	f	Macrosetella gracilis	2	
bispinosa	4		Mecynocera clausi	2	3
norvegica		2	Megacalanus longicornis		1
simplex	a	f	Microcalanus pusillus	2	2
truncata	a	c	pygmaeus	f	f
Canthocalanus pauper		1	Microsetella rosea	c	c
Centropages calaninus	f		Neocalanus gracilis		4
Clausocalanus arcuicornis	f	c	robustior		2
Clytemnestra rostrata	1		Oithona fallax		2
Copilia denticulata	f	f	plumifera	f	
quadrata	3	2	setiger		2
vitrea	1		similis	c	c
Corycaeus anglicus		r	spinirostris	f	f
clausi		2	Oithorina nana	2	2
crassiusculus	c	a	Oncaea curta	r	
dubius		1	media		f
furcifer		r	minuta	c	a
limbatus	1		similis	c	
longistylis	2	f	tenella	2	
ovalis	3		venusta	a	a
pumilus	f		Paracalanus parvus	c	c
speciosus	3		Pseudocalanus minutus	c	c
Eucalanus attenuatus	f	f	Rhincalanus cornutus	1	
crassus	f		Sapphirina auronitens	2	1
elongatus	f		metallina		3
Euchaeta marina	c	c	nigromaculata	1	3
Euchirella brevis	1	2	Scolecithricella minor	1	
Farranula carinata	c	a	Scolecithrix danae	c	c
curta	4		Undinula darwini	2	f
gibbula	f		Vettoria granulosa		4

REMARKS. The temperature was high and diminished nearly one degree, while the salinity increased half a point, and the hydrogen ion remained practically the same. Fifty-three species were taken in the 50-meter tow and fifty-four species in the 100-meter tow, an exceptionally even depth distribution. Forty-one species (55%) were present in one tow and absent from the other, while thirty-three species were found in both tows.

do

S T A T I O N 109

(90 species)

23° 22' N.. 144° 08' E. May 29,, 1929

Bottom depth 5252 m..

Depth of tow,m.	0	50	100
Temperature,, C'	27.4	23.1	19.4
Salinity,, o/oo	35.0	34.9	34.8
Volume of tow, cm³	32	64	128
Acartia danae		c	a
Acrocalanus gibber	f		5
gracilis	f	f	c
longicornis	r	f	
Aetideus armatus			3
giesbrechti		1	
Calanus minor		f	f
Calocalanus pavo		4	f
plumulosus		2	3
styliremis			2
Candacia bispinosa		f	2
simplex		f	f
truncata		c	f
varicans		2	
Canthocalanus pauper			4
Centropages calaninus	2	2	
elongatus		2	
Clausocalanus arcuicornis	2	f	c
furcatus		r	
Clytemnestra scutellata			4
Copilia denticulata		f	
mirabilis		3	
quadrata		2	f
recta		4	5
vitrea			2
Corycaeus agilis		r	
crassiusculus	f	a	c
dubius		r	
flaccus		1	
lautus			r
longistylis			ff
pumilus	r		
speciosus		c	c
typicus		r	
Eucalanus attenuatus		f	f
elongatus		2	
Euchaeta acuta		2	
marina		a	f
Euchirella brevis		2	1
Farranula carinata	a	c	
gibbula	c		
gracilis	f		
rostrata	a	f	f
Haloptilus longicornis			f
Heterorhabdus papillager			f

Depth of tow,m.	0	50	100
Density, σtP.	22.6	24.1	25.2
Hydrogen ion pH	8.23	8.23	8.22
Length of tow,miles	1.4	1.5	1.5
Heterorhabdus spinifrons			2
Labidocera detruncata	f		
Lubbockia squillimana		3	c
Lucicutia clausi			c
flavicornis			c
longicornis		2	
Macrosetella gracilis	f	3	2
oculata			1
Mecynocera clausi		5	c
Microcalanus pusillus			4
pygmaeus		f	4
Microsetella rosea		f	c
Monstrilla inserta		2	
Neocalanus gracilis		a	a
robustior		f	c
tenuicornis			c
Oithona attenuata		f	
plumifera		2	f
similis		f	c
spinirostris		f	f
Oithonina nana			2
Oncaea conifera		3	
curta		r	
media	r		
minuta	f	a	a
similis	r		
tenella			r
venusta	c	a	a
Pachosina piona	3		
Paracalanus parvus		c	c
pygmaeus			f
Phaenna spinifera		f	
Pleuromamma abdominalis			1
Pontella lobiancoi (?) juv.	2		
Pontellina plumata		1	
Pseudocalanus minutus		c	c
Sapphirina angusta		2	
auronitens	1		5
metallina			f
nigromaculata		3	
stellata			3
Scolecithricella bradyi			4
Scolecithrix danae		f	
Undinula caroli			2
darwini		c	c

REMARKS. The high surface temperature fell four degrees at the 50-meter depth and four more at the 100-meter depth: the salinity and hydrogen ion remained

S T A T I O N 110

(55 species)

do

26° 20' N.. 144° 24' E.. May 31,. 1929

Bottom depth 3036 m..

Depth of tow,m.	0	50	100	Depth of tow,m.	0	50	100
Temperature, C.	23.8	18.3	17.9	Density, σ_tP.	23.4	25.2	25.5
Salinity, o/oo	34.7	34.7	34.7	Hydrogen ion pH	8.18	8.18	8.1.
Volume of tow,, cm^3	48	48	48	Length of tow,miles	0.5	0.5	0.5
Acartia danae		c	f	Lubbockia squillimana			1
Acrocalanus gracilis	a	c	c	Lucicutia clausi		4	c
Aetideus armatus			4	flavicornis		c	a
Calanus minor		c	c	Macrosetella gracilis	5		
propinquus	1			Mecynocera clausi		r	f
Candacia bispinosa		1		Megacalanus longicornis		1	1
simplex		r		Microcalanus pygmaeus		r	r
Canthocalanus pauper		f		Neocalanus gracilis		c	a
Clausocalanus arcuicornis	4	f	c	robustior		c	f
furcatus			3	tenuicornis		2	f
Clytemnestra scutellata			2	Oithona similis	3	f	f
Copilia mirabilis		1		spinirostris			f
Corycaeus catus		r		Oncaea conifera		3	
crassiusculus	f	r	a	media	f		
limbatus	3			minuta		a	c
pacificus		2		notopa			2
pumilus		f		venusta	f	a	a
typicus		r		Paracalanus aculeatus		4	
Eucalanus attenuatus		2	1	parvus	f	c	c
Euchaeta marina			2	pygmaeus			r
Farranula carinata	f			Pseudocalanus minutus		c	c
gibbula	f			Rhincalanus cornutus		1	
rostrata	f			Sapphirina angusta		2	
Haloptilus ornatus,juv. ♂			1	Scolecithricella bradyi			2
Heterorhabdus papillager			f	Scolecithrix danae			4
spinifrons			2	Undinula darwini		a	a
Labidocera detruncata	f			Pandarus zygaenae	on a shark		
Phaenna spinifera		2	5				

REMARKS. The moderate surface temperature fell six degrees in the 100 meters, while the salinity and hydrogen ion remained exactly the same. There were fourteen species in the surface tow, thirty-two in the 50-meter tow and thirty-three in the 100-meter tow. Thirty-three species (60%) were each confined to a single depth and six species were present at all three depths. Corycaeus, Oithona and Oncaea were distributed at all three depths, but at this station the three Farranula species were confined to the surface tow alone. Candacia and Sapphirina appeared only in the 50-meter tow. Fifteen specimens of Pandarus zygaenae, including both sexes, were taken from a shark captured at the surface and constitute the only record for this parasitic copepod.